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Self-Reboot-Mobility of Self-Cleaning Antimicrobial Industry on Textiles and Apparel for Impact of COVID-19

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ABSTRACT

Self-reboot-mobility of self-cleaning antimicrobial industry on textiles and apparel is receiving an increasing amount of interest worldwide as a method to address Antimicrobial in materials. In particular, for advanced high-performance fiber-reinforced polymer of self-reboot-mobility (SRM) with composite materials, Self-reboot-mobility of self-cleaning antimicrobial industry on textiles and apparel offers an alternative to employing conservative damage-tolerant designs and a mechanism for ameliorating inaccessible and invidious internal Antimicrobial within a structure. This article considers in some detail the various self-reboot-mobility of self-cleaning antimicrobial industry on textiles and apparel technologies currently being developed for SRM with composite materials. Key constraints for incorporating such a function in SRMs are that it not be detrimental to inherent mechanical properties and that it not impose a severe weight penalty.

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Introduction

Nowadays, people with COVID-19 do not have safe to clean their daily cloths. Nature and textiles have very close relationship. The concept of Self-Reboot-Mobility (SRM) was inspired by the surface of Egyptian Lotus leaves, which are well known for their ability to self-clean by repelling water and dirt. Science of Nanotechnology had open a door for the scientist to develop Self-Reboot-Mobility (SRM) surface which can be cleaned itself without using any laundering action. Nanotechnology is a new hope in the textiles and apparels fields which can give fresh cloths every day especially for hospitals and quarantine hospitals for Corona patients. The application of Self-Reboot-Mobility (SRM) properties on textile surfaces by using the nanotechnology includes a vas potential for the development new products [1]. This study will cover the areas of different methods of Self-Reboot-Mobility (SRM) process, types of chemical used, application on to different fabric and products, innovation and development, present and future trend of nanoself-cleaning, limitations. The self-cleaning finishes has a great opportunities and has large areas of applications like hospitals and quarantine hospitals for Corona patients garments" Patient's rooms furnishings (bed linen and sheets, towels and bathrobes, blankets, curtains), sportswear, military uniform, smart textiles, upholstery, under garments etc. Fourth kinds of self-cleanings have come out namely physical, chemical and biological self-cleaning:

A) The physical self-cleaning means physically removal of dust and dirt particles present on any surface. These surfaces are available in nature like Egyptian lotus leaves, rice leaves and wild ducks feathers [1,2].
B) The chemical self-cleaning refers to chemically degradation of stains present on the surface,
C) and the biological self-cleaning means killing of bacteria if they attach on the surface and prevention of their growth [3].
D) Self-Reboot-Mobility. Self-Reboot-Mobility of Self-Cleaning antimicrobial industry on textiles and apparel for Impact of COVID-19 (Self-Reboot-Mobility (SRM) is combinations of IT (information technology) and OT (operational technology) for more scope for development in manufacturing industry).

Micro Level of Self-Reboot-Mobility

Throw the Self-Reboot-Mobility (SRM) is combinations of IT (information technology) and OT (operational technology) for more scope for development in manufacturing industry, is so far penetrated into world daily life that passenger bus rides are often charged based on facial recognition technology. Furthermore, smart devices are connected to utilities such as like hospitals and quarantine hospitals for Corona patients, which are electronically connected to a system that alerts authorities when they are full [4]. Thus, both the built environment and citizens in the major cities have been oriented towards the adoption of the enhanced use of the Self-Reboot-Mobility (SRM) is combinations for more scope for development in manufacturing industry. For the past 5 years and running technology for Impact of COVID-19. As a result, world has the most sophisticated Self-Reboot-Mobility (SRM) is combinations for more scope for impact of COVID-19 for development in manufacturing industry. In addition, it has the best technological manufacturing industry in the world [5]. With the help of the Self-Reboot-Mobility (SRM) is combinations for more scope for Impact of COVID-19for development in manufacturing

industry, big data, and AI, cities can perform continuous monitoring, offer catastrophe warnings, and make quick decisions [6]. Among the other sectors, health care has benefited significantly due to the heightened adoption of new-age technologies [7]. As a result, world has one of the strongest technological potentials for handling pandemics compared to other countries. Population growth in urban areas has resulted in cities, especially in North America and Europe, adopting smart city technologies [8]. The European Union, for example, Initiated several strategies including the European Smart Cities & Communities initiative and the European innovation partnership for smart cities and communities [9,10]. So as the intelligent village in 6th October city in Egypt. These programs allow European cities access resources from the European Commission to transform their cities into smart cities. Most COVID-19 affected countries in the Western context are known for their advanced smart cities. These countries are highly interconnected with each other largely due to their geographical proximity and the trading partnerships they have with World. This is the reason the COVID-19 pandemic was able to easily transfer to the major cities in these countries from world [11,12]. The Self-Reboot-Mobility (SRM) is combinations for Impact of COVID-19 for more scope for development in manufacturing industry, is interconnected into the physical and human world to offer smart solutions for city-wide problems [13]. Shows how New York, for instance, one of the cities highly affected by COVID-19, adopted the Self-Reboot-Mobility (SRM) is combinations Hospitals and quarantine hospitals for Corona patients, for gathering insights from the communities. Other smart cities in the USA [14]. When it comes to Europe, also built its smart city technological ecosystem to enhance its usage of smart technologies. Especially, Reboot-Mobility (RM) is combinations for Impact of COVID-19 driven services in Barcelona smart city have claimed to improve quality of life for its citizens [15]. Argue that Milan, an intelligent smart city in Italy, was built around several innovative mechanisms to adopt intelligent technologies. Further research emphasizes other intelligent cities including Berlin, London, Paris and Amsterdam [16,17]. Given the level of intelligent technologies adopted, intelligent cities are claimed to offer best living conditions and are equated with healthy cities [18].

Techno-Self-Reboot-Mobility Driven Approach

Growth of smart cities in world throw Impact of COVID-19, the techno- or human-driven approach that generally cities adopt in their smart city governance determines their level of technological usage to interact with citizens. Self-Reboot-Mobility of Self-Cleaning antimicrobial industry on textiles and apparel in the hospital techno-driven approach largely places heightened importance on technologies and makes citizens subordinate to the technologies adopted in the cities. Techno-driven approach does not take 'context' into consideration, rather expects technologies to fix all the glitches in cities [19].

Coronavirus Techno-Innovation Map

Global map of solutions created in response to COVID-19 with rankings of top innovative locations. As illustrated in figures 1 and 2

Figure 1: illustrated 66 of initiatives of coronavirus techno-innovation map global map of solutions created in response to COVID-19 with rankings of top innovative locations [20].

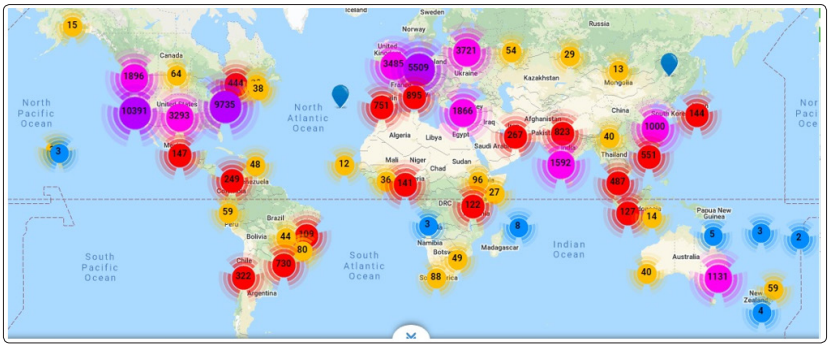

Figure 2: illustrated (66 of initiatives of coronavirus techno-innovation map global map of solutions created in response to COVID-19 with rankings of top innovative locations [20].

a) Blue Ocean Robotics, Disinfection Robots, and Location: Odense, Denmark: Blue Ocean Robotics has deployed its disinfection robots to cities around the world hit hard due to the coronavirus. This disinfectant robot uses UV rays to promote contactless cleaning to help prevent the spread of the virus.
b) Neurobotics: Workplace contact tracing robots, Location: Moscow, Russia, The robot identifies patients and prevents the spread of coronavirus among employees. The robot connects to a database of employees', recognizes and addresses each person individually, as well as recommends certain actions depending on the well-being and condition of the employee
c) PAL Robotics: Autonomous robot for disinfection, Location: Barcelona, Spain, PAL ROBOTIC designs and manufactures robotic platforms to improve the quality of life in our society, which are safely integrated into our environment. The robot integrates UV-C ultraviolet light devices for disinfection through autonomous navigation through spaces, disinfecting surfaces in its path. This system reduces the need to expose people [20].
We have several, you just have to find them in the category "Prevention" and subcategory "Protective and Sanitation" on the site :) As illustrated in figure 3:

Figure 3: illustrated : Cairo 3, a remote-controlled robot that runs tests on suspected coronavirus disease (COVID-19) patients to limit the human exposure to the virus is seen next to a healthcare worker in a corridor of the hospital, Amid a second wave of infections in Tanta, Egypt, November 18, 2020 [21].

Challenger "Disadvantages /Limitations"
- Self-Reboot-Mobility (SRM) textiles take a long time to clean themselves. More active catalyst are therefore needed to speed up the cleaning process.
- The high oxidation power of the catalyst will not only degrade the stains but will also adversely affect the fibers themselves.
- The mechanical strength (i.e. tearing strength) & durability of fabric get reduced considerably. The catalyst is also skin irritant [19].
- Carbon nano tubes based Self-Reboot-Mobility (SRM) coatings have limited applicability as they turn dark in colour after the coating.
- Sunlight is the best source of light for activating the Self-Reboot-Mobility (SRM) process.

Objective of the Study
- To study the self-cleaning finishes in textile.
- To understand the application of nanotechnology into Self-Reboot-Mobility (SRM) finishes.
- To design Self-Reboot-Mobility (SRM) finishes product.

The significance of the study
- Self-Reboot-Mobility (SRM) finishes in the textile product helps in easy maintenance and environmental protection.
- Using of Self-Reboot-Mobility (SRM) product will save time, material, energy reduction and consequently cost-efficiency during production.
- People need not to suffer from heavy laundry bills and cleaning efforts.
- It will improve ageing behavior by extended surface purity effect.

Research Methodology
- Secondary research: articles, journals and books
- Primary: Informal discussion with the experts and experimental research.

Self-Reboot-Mobility of Self-Cleaning antimicrobial industry on textiles and apparel for impact of COVID-19

Systems of Lockdown and Quarantine
Impact of COVID-19 there are a new health code was implemented in over 100 cities via an online accreditation prevention system allowing people to share their travel history and health status. And now every citizen is allocated with a QR (also known as Quick Response) code, which allows to track his/her movements. When citizens use public domestic services such as public transportation or visit a super market, they are expected to scan their QR code. Those allocated a red color code were either affected by the virus or those had travelled recently to Hubei province. Those given a yellow code were required to self-isolate for two weeks (the incubation period for detecting the virus and those given a green code retained access to the city [22,23].

Manufacturing Method
The self-cleaning and Self-Reboot-Mobility (SRM) textiles without the intervention of the human element to preserve human safety from Corona-Virus be manufactured by two ways
- Traditional method: Application of fluorocarbons
- New method: Application of nanotechnology

Basis Work
This basis work in such a way that if the critical surface tension of material solid of fabrics are more than the surface tension of liquid, then liquid will wet the material solid of fabrics. So if the critical surface tension of solid is reduced than that of liquid, the water repellency can be achieved. The water repellency effect can be imparted on material solid of fabrics by using fluorocarbons, which are the carbon compounds containing perfluorinated carbon chain. These carbon compounds form thin cover coated film around the fiber and possess a very low surface tension of around 12 dyne/cm. So the drop does not adhere to the surface fibers of fabrics [24].

Succinctness of Limitation
The succinctness of application of self-cleaning antimicrobial industry on textiles by fluorocarbons are as follows:
- Fluorine compounds may cause human skin related problems
- Effect will reduce antimicrobial industry on textiles after few washes
- Textiles and apparel goes yellow with exposure to heat, UV light and high relative humidity

Antimicrobial Industry by Nanotechnology
To overcome the above listed problems due to the application of fluorocarbons, new methods have been developed using nanotechnology, which are suitable for the production of Self-Reboot-Mobility (SRM) surface without the intervention of the

human element to preserve human safety from Corona-Virus by involving nanotechnology [25].

- In the first place extremely water repellent, microscopically rough surfaces: dirt particles can hardly get a hold on them and are, therefore, removed by rain or by a simple light spots like rain in water.

-The second type is given by photo-catalytic layers: due to a layer of nano crystalline titanium oxide, fouling organic material of fabric is destroyed by solar irradiation The manufacturing of Self-Reboot-Mobility (SRM) textiles using nanotechnology: (Photocatalyst- microwaves - carbon nanotubes- Metal oxide colloidal- silver nanoparticles- chlorine halamine - Polyvinylidene Fluoride Film).

Research Approach

This section highlights the data selected from over all the world for conducting the study, the methods, and the analytical approach adopted, for self-reboot-mobility of self-cleaning antimicrobial industry on textiles and apparel for impact of COVID-19, for hospitals and quarantine hospitals for corona patients for impact of COVID-19.

Selection Data of Innovations Literature

The heightened interest and with a given the heightened interest role world plays in the global innovations technology markets and the networks it forges across the globe, there has been a heightened interest among the governments, Innovations businesses, healthcare providers, and individuals to seek further information about Coivd-19 and the mechanisms that help world fight in controlling the transmission of the pandemic. WHO has urged the world government, medical community and scientists to publish information actively about the emergent trends, as the virus transmitted to other parts of the globe towards the end of January 2020, and the beginning January of 2021, Western and East media have made a significant effort to show how Innovations technology has been used by Western and East democracies in controlling the transmission.

In addition, the scientific publishing houses have fast tracked publishing and some Innovations on COVID-19 and made all the published research openly available for anyone to use. Further, media outlets have shown keen interest in not only publishing current trends and Innovations, but also various interventions being initiated to control the outbreak COVID-19, Given the availability of the information from both scientific and media publishing houses for the COVID-19 related literature, I have chosen to review the scholarly articles, WHO reports, and newspaper articles to address my research for The intensification of efforts for innovations to serve humanity. To maintain human safety and health by remote dealing with the modern systems presented to the subject of the research self-reboot-Mobility of Self-Cleaning antimicrobial Industry on textiles and apparel for Impact of COVID-19.

Analysis Methods

Throw academic articles, and ran through a search in Scopus on 31st March 2020 with search phases such as Coronavirus or COVID-19 and 66 innovations and limited the search to identify those articles which were published in the year 2020, this search resulted in a total of 250 publications. I have chosen only those which were published in 2020 because COVID-19 was first identified at the end of December 2019. And early 2020. Furthermore, I have also refereed through 250 news items that covered the In 12 months of the pandemic and focused on innovations technologies. The search was conducted in google news and limited to the global popular media outlets including BBC news, MBC Egypt, CNN, the guardian, Business Insider, Global Times world, The New York Times, The Telegraph, The Economist, Reuters, and financial Times.

The use of media outlets to identify the on innovations technologies novel mechanisms Self-Reboot-Mobility of Self-Cleaning Antimicrobial Industry on textiles and apparel for impact of COVID-19 has been useful to understand the trends and the approaches adopted by various governments [26]. In line with the research problems, I have largely focused on innovations Technological responses adopted by world and other Western and east countries. In additions, I have read 205 situation reports released by the WHO. These reports have been released on a daily basis starting from 15 January to 15 December 2020. The use of research articles and innovations Technological, WHO situation reports and news from east and western media outlets form a basis to triangulate the data [27]. As part of the analysis, I used the WHOs recommendation and adopted three constructs– identify, isolate and quarantine for reducing the virus transmission, and seven additional constructs from the adoption and use of innovations technologies to probe technoor human-driven innovations approaches. Those constructs of innovations include governance, smart innovations technology usage, privacy concerns, lockdown, activism, information sharing, and infodemic. These constructs are drawn from the data, allowing to understand whether governments adopt innovations techno- or Human-driven approaches and associated benefits and concerns.

Self-Reboot-Mobility Technologies and COVID-19

The virus outbreak in Wuhan smart city and its quick spread to other cities forced the central governments to step up a self-reboot mobility (SRM) is combinations of it (information technology) and of (operational technology) for more scope for development self-cleaning antimicrobial industry on textiles and apparel for impact of COVID-19, in manufacturing industry, as systems into motion by bringing together different key stakeholders and devices to changing furniture and clothes and carrying out washing and sterilization operations and track the individuals who were infected. In the line of the WHO's (2020b) recommendation to identify, isolate and quarantine those who are infected, antimicrobial into motion by bringing together different key stakeholders and devices to changing Antimicrobial furniture and clothes and carrying out washing and sterilization operations [28]. Overall, the system are highly efficient and a source of relief for the overstressed health system in world, and The data collected from different Self-Reboot-Mobility (SRM) is combinations of IT (information technology) and OT (operational technology) for more scope for development in manufacturing industry, devices are shared with the central server and analyzed using AI to supply the necessary medical resources. In the smart city, administrators coordinated with a consortium comprising well-known laboratories and set up an emergency response center in Quarantine hospitals to enhance the city's Self-Reboot-Mobility (SRM) testing potential.

A Humanitarian Perspective and Smart Technologies of COVID-19

While world was able to policies in containing the virus transmission, such an approach of Quarantine hospitals may be hard to impose anywhere world. While world largely focused on identifying those who are infected, Western democracies have focused on human-driven approach, ensuring lockdowns, and quarantine. Self-Reboot-Mobility of Self-Cleaning antimicrobial

industry on textiles and apparel for impact of COVID-19, how this strategy varies from that adopted in world is now considered.

Active System and Identifying the Infected the Textiles and Furniture's

The universities and start-ups developed new apps that allow people to share their data. The UK Covid symptom tracker app, for example, tracks the symptoms of infected individuals and determines the range of virus spreading in a particular area to help understand why some people become critically unwell compared to others. In order to collect more personalized data, startups have come forward to create voluntary and privacy-conscious tracking apps such as: Safe Paths in the USA, and GeoHealth in Germany which aims to collect GPS location data and store it for 28 days. These apps allows individuals to share their data with health officials, should they be tested positive for the virus [29]. Similarly, Germany has developed corona data donation smart watch App which gathers anonymous data from volunteers to track down the infections. Therefore to respect the privacy of citizens [30]. And new theory of Self-Reboot-Mobility for Self-Cleaning antimicrobial industry on Textiles and apparel for Impact of COVID-19.

Communicate Innovations Planning the Potential of Technologies

United Nations Development Program (2015) for instance highlighted that, world smart cities are largely focused on the technology infrastructure, known as hardware [31]. Communities are seen as passive beneficiaries of these technologies rather than playing an active role in the society, which resonates with the hard technological determinism [32]. Overall, the world context illustrates how technologies can be largely used to communicate Innovations planning and to impose citizen compliance. Nature has already developed an elegant approach that combines chemistry and physics to create super repellent surfaces as well as Self-Reboot-Mobility (SRM) surfaces. The concept of Self-Reboot-Mobility (SRM) textiles is as based on the lotus plant whose leaves are well-known for their ability to 'self-clean' by repelling water and dirt. Nanotechnology provides this concept self-cleaning textiles which give Self-Reboot-Mobility (SRM) as well as fresh cloths every day, this not only technically benefited but also techno economically benefited. The textiles and apparels surface which can clean by itself without using any laundering action of (SRM). The lotus leaf has two levels of structure affecting this behavior of micro-scale bumps and Nanscale hair-like structures coupled with the leaf's waxy chemical composition. Nano Self-Reboot-Mobility (SRM) finishes has a large area of application. However we talks about the existing and invention of new product made of nanoself-Reboot-Mobility (SRM) for fabrics and clothes. and there is The effects of Nano finishing are in controversy, It is says that nanoparticles are very small that they can easily get inside of the human skin and may cause skin related disease especially when using Nano silver particle, but till today there is no paper research mention about the possible health hazards. Some of the researcher mentioned sunlight is the only best source of light for activating Self-Reboot-Mobility (SRM) process. If sunlight is the only possible option Egypt is rich in sunlight then the application will be confined only for the outdoor wear. No laundry sounds like a dream clothes that can clean themselves while they are being worn. We can't imagine how many little's of water we waste every day to wash one garment. It's not only that but the detergents that we used, energy and time spend. Where there is a will there is always a way to do something. Everything can be possible with the help of the advanced technology such as Self-Cleaning antimicrobial industry [28]. Nowadays nanotechnology antimicrobial has successfully achieved Self-Reboot-Mobility (SRM) finishes and this will soon replace all the ordinary washing machine. What add interest to do this research is for wider and a better design application by using the Self-Reboot-Mobility (SRM) fabrics [32].

Antimicrobial of Used Photocatalyst

By Using Photocatalyst process Nano-sized, Titanium dioxide and zinc oxide are used for imparting Self-Reboot-Mobility (SRM) and anti-bacterial properties. Nano-crystalline titanium dioxide sols were prepared by hydrolysis and condensation reaction of 94% titanium tetra-isopropoxide in an acidic aqueous solution (pH 1) of glacial acetic acid and 35% hydrochloric acid wherein the concentration of titanium dioxide (TiO_2) precursor varied. The composites were heated at 60°C under vigorous stirring for 1:35 hours. It is found that the intrinsic low-stress mechanical properties of fabrics change after the Self-Reboot-Mobility (SRM) Antimicrobial coating treatment. The tensile extensibility of coated fabrics decreases and the surface roughness increases [33]. The fabrics is coated with a thin layer of titanium dioxide particles heaving 25 nanometers diameter. Titanium dioxide is a Photocatalyst, when it is illuminated by light of energy higher than its band gap, electrons in TiO_2 will jump from the valence band to the conduction band, and the electron (e-) and electric hole (h+) pairs will form on the surface of the Photocatalyst. The negative electrons and oxygen will combine to form O_2, radical ions, whereas the positive electric holes and water will generate hydroxyl radicals OH. Antimicrobial since both products are unstable chemical entities, when the organic compound (i.e. dirt, pollutants, and microorganisms) falls on the surface of the photo catalyst it will combine with O_2' and OH' and turn into carbon dioxide (CO_2) and water (H_2O). Antimicrobial Since the titanium dioxide acts as a catalyst, so it is never used up. This is how the coating continues breaking down stains over and over. Zinc oxide is also a photo catalyst as illustrated in figures 4(a,b), and the photo catalysis mechanism is similar to that of titanium dioxide [34].

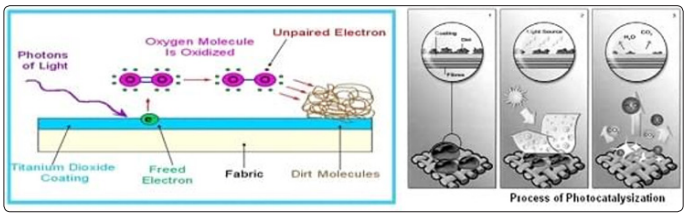

Figure 4: a) Photocatalytic Self-cleaning property of Titanium dioxide
b) Working of Self-cleaning textiles [35].

According to the Self-Reboot-Mobility (SRM) smart technology in this work uses titanium dioxide photo catalyst that, when triggered by light, it decomposes dirt, stains, and harmful microorganisms and so on. Fabric samples were stained with Tomato sauce and ketchup. After 24 hours of exposure to simulated sunlight, the coated fabric showed almost no signs of the red stain, whereas the untreated fabric remained deeply stained which antimicrobial and Self-Reboot-Mobility (SRM) textiles using nanotechnology.

Antimicrobial of Used Microwaves

By Using a new antimicrobial technology developed, which make possible to attach nanoparticles to clothing fibers by use of microwaves. So chemicals that can repel water, oil and bacteria are directly bound to the nanoparticles. These two elements combine to create an antimicrobial protective coating on the fibers. This coating both kills bacteria, and forces liquids to bead and run off. The same technology, created by scientists working for the U.S.

Air Force, has already been used to create t-shirts and underwear that can be worn hygienically for weeks without washing [34,36].

Antimicrobial of Used Carbon Nanotubes

By using throw the intelligence artificial Egyptian lotus leaf structures were fabricated on textiles and apparel via the controlled assembly of carbon nanotubes. Carbon nanotubes (CNTs) and surface modified carbon nanotubes are used as structures building blocks to Biomimic the surface microstructures of Egyptian lotus leaves at the Nanscale [37]. And cotton fabrics, which otherwise have nanotube perfect water absorption; have been endowed with super hydrophobic properties. Afterwards water contact angle was increased and found greater than 150 degree As illustrated in figure 5 [34].

Antimicrobial of Used Metal Oxide Colloidal

By using the fabric is dipped and processed in metal oxide colloidal solution and then it is given heat treatment. Due to that fabrics get surface roughness on nanometer scale. After that through water repellent treatment, the fabrics has surface with water contact angle above 1500 [34].

Antimicrobial of Used Silver Nanoparticles

By using Water repellent coating of silver nanoparticles that offer superior resistance to dirt as well as water and require much less cleaning than conventional textiles and apparel. Nano-Tex improves the water-repellent property of fabrics by creating nanowhiskers, which are made of hydrocarbons and have about 1/1000 of the size of a typical Egyptian cotton fibers as illustrated in figure 6. They are added to the clothes to create a peach fuzz effect without lowering the strength of cotton [34].

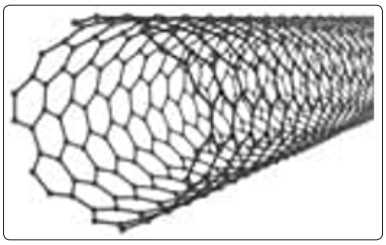

Figure 5: Carbon nanotubes[6]

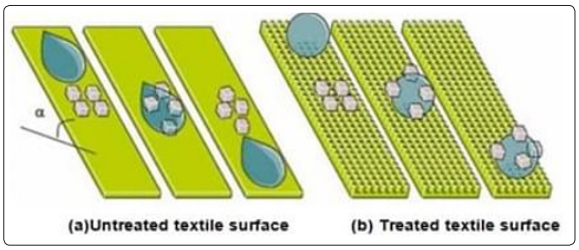

Figure 6: Working of nanoparticles in textile surface[35]

And when comparing the previous two methods that the two textile surface, which one is treated with silver nanoparticles and other is not treated with silver nanoparticles. The untreated Fabrics surface having dust particles, when water droplets rolls over it do not get washed off because dust particles are adhere by textile surface. While treated textile surface do not adheres the dust particles hence when water particles rolls over it dust get washed off [34].

Antimicrobial of Used Chlorine Halamine

By using the antimicrobial technology works by attaching chlorine-containing molecules called halamines to textile fibers. Chlorine in the form of halamines has powerful bacteria-killing properties, unlike chlorine gas, there are no adverse effects since toxic chlorinated carbon atoms are not generated. By sticking halamines to the cellulose fibers like linen and cotton, the bacteria-killing effect can be bonded to the material and used again and again. Eventually, the chlorine is used up but can be regenerated with a wash in chlorine bleach. The halamine-treated fabrics kill microorganisms almost instantly on contact, so these materials are best suited for medical uses the world needs in this period of the Corona pandemic such as uniforms, wipes, bedding and towels. [34].

Antimicrobial of Used Polyvinylidene Fluoride (PVDF)

Self-Cleaning antimicrobial of polymer with low surface energy, and resistant to ultraviolet (UV) degradation, atmospheric chemical attacks, and algae and fungal attacks on fabrics. They are highly flexible and hard to crack, thus easy to handle during installation. Hence, PVDF is usually used as the topcoat of architectural And home furniture membrane structures, roof materials of vehicles, tent fabrics, raincoat material, and the cover of outdoor air-conditioners [38].

Antimicrobial of used Plasma Technology

Another solution for antimicrobial by Self-Reboot-Mobility (SRM) property plasma treatment is another way to achieve Self-Reboot-Mobility (SRM) property in the textiles and apparel. It is a special coating process on which organic molecules are polymerized followed by deposition on textile and clothes surface. Ultra hydrophobic coating of nanoparticles imparts a rough surface morphology to textiles. Use of plasma in textiles is a method of generating multifunctional textile fibers means fibers with fire retardant and water resistance properties [34].

Antimicrobial Areas of Application

The Self-Reboot-Mobility (SRM) textiles have various areas for applications from fabric of home to technical textile of industries. The major areas are Apparels & accessories, medical textiles, Quarantine hospitals and hygienic textiles, sports wears, Military & Defense uniform, upholstery, outdoor textiles and automotive. Some other areas for application are glass windows, road signs and banners, bathrooms & sanitary appliances, flooring and roofing tiles, outdoor surfaces & shades, house walls and paints, ship hulls and plastic wares [34].

Economic Significance

The economic significances of Self-Reboot-Mobility (SRM) textiles are as follows:

- Maintaining human safety and health
- Helping quarantine hospitals get rid of Corona virus' Maintaining the safety and health of humans, medical and nursing teams, this leads to saving the expenses of treatment and medicine for the injured at the strategic level.
- Ease of maintenance and environmental protection specialty of quarantine hospitals due to reduced cleaning efforts
- Resource conservation (time, energy and money)
- Durable & long lasting
- Dispensing with the human element (in the interest of human safety) in transporting and washing procedures and People need not to suffer from heavy laundry bills
- Improved ageing behavior of clothes by extended surface purity effect.

Opportunities for Design and Production

As research continues and knowledge matures in the area, more exciting developments are expected that will allow Self-Reboot-Mobility (SRM) to expand its frontiers into many as yet unknown and unexplored domains.

Designers have a great opportunity to come up with an innovative design concept in Medical textiles e.g. Hospital garments so this areas that can be applied in various areas like:

- Medical textiles e.g. Hospital garments (quarantine hospitals get rid of Corona virus' Maintaining the safety and health of humans, medical and nursing teams).
- Sports tech as (Athletic wear).
- Defense textiles as (Military uniforms).
- Smart textiles
- Upholstery
- Undergarments (for human body)

However, Self-Reboot-Mobility of Self-Cleaning Antimicrobial Industry on Textiles and Apparel for Impact of COVID-19 , and for military persons or hikers, who are outside in the sun for long periods of time without the time or means to clean their clothes, Self-Reboot-Mobility (SRM) fabric would be ideal as the sun is a good source for Self-Reboot-Mobility (SRM).

Urgent opportunities for design and production further research would be required to test ways of applying nanoparticles to textiles.

Conclusions

Helping quarantine hospitals get rid of Corona virus' maintaining the safety and health of humans, medical and nursing teams, this leads to saving the expenses of treatment and medicine for the injured at the strategic level. Opportunities for design and production the opening of new application fields for textiles will lead to a new growth stage. Self-Reboot-Mobility (SRM) fabrics, hospitals and quarantine hospitals for corona patients. The application of Self-Reboot-Mobility (SRM) properties on textile surfaces by using the nanotechnology includes a vast potential for the development new products. Fourth kinds of self-cleanings have come out namely physical, chemical and biological self-cleaning:

A) The physical self-cleaning means physically removal of dust and dirt particles present on any surface. These surfaces are available in nature like Egyptian lotus leaves, rice leaves and wild ducks feathers.

B) The chemical self-cleaning refers to chemically degradation of stains present on the surface,

C) and the biological self-cleaning means killing of bacteria if they attach on the surface and prevention of their growth.

D) Self-Reboot-Mobility. Self-Reboot-Mobility of self-cleaning antimicrobial Industry on textiles and apparel for Impact of COVID-19 (Self-Reboot-Mobility (SRM) is combinations of IT (information technology) and OT (operational technology) for more scope for development in manufacturing industry).to help and are not only repellent to water but are also resisting stains, dirt, odor and are antimicrobial as well.

Water through these surfaces easily rolls off and completely cleans the surface in the process. Self-Reboot-Mobility (SRM) effect on textile materials lead to an efficient use of materials and are therefore in agreement with the principles of sustainable development. One of the key processes to disable viruses is through the control of their surface structure self-cleaning antimicrobial Industry on textiles, especially their binding sites, so they can no longer recognize the receptor site on the host cells. As many types of antimicrobial and antiviral nanocoatings applications include, but are not limited to: medical facilities and laboratories, medical equipment; fabrics and clothing like face masks; Hospital furniture; nanocoatings attack most effectively on the virus's surface, they represent an excellent viable technology to destroy the virus's surface structure of textiles and apparel for impact of COVID-19.

References

1. A Ebru Tayyar GA (2014) "Outdoor usage performances of woven fabrics dyed with self-cleaning dyes". The Journal of The Textile Institute 106: 303-310.
2. Arther Price AC (1994) "Fabric Science ". New York: Fairchild Publication.
3. Chenghui Zheng ZQ (2014) Self-cleaning Bombyx mori silk: room-temperature preparation of anatase nano-TiO2 by the sol–gel method and it's application. Coloration Technology 130: 280-287.
4. Andrelini J (2019) How China's smart city tech focuses on its own citizens.
5. Li L (2018) China's manufacturing locus in 2025: With a comparison of "made-in-China 2025" and "industry 4.0". Technological Forecasting and Social Change 135: 66-74.
6. Zhu S, Li D, Feng H (2019) Is smart city resilient? Evidence from China. Sustainable Cities and Society 50: 101636.
7. Sun TQ, Medaglia R (2019) Mapping the challenges of artificial intelligence in the public sector: Evidence from public healthcare. Government Information Quarterly 36: 368-383.
8. Albino V, Berardi U, Dangelico RM (2015) Smart cities: Definitions, dimensions, performance, and initiatives. Journal of Urban Technology 22: 3-21
9. Kylili A, Fokides PA (2015) European smat cities: The role of zero energy buildings. Sustainable Cities and Society 15: 86-95.
10. Cardullo P, Kitchin R (2019) Smart urbanism and smart citizenship: The neoliberal logic of "citizen-focused" smart cities in Europe. Environment Planning C: Politics and Space 37: 813-830.
11. Cohen J, Kupfesrchmidt K (2020) Strategies shift as coronavirus pandemic looms. Globalization and Health, 367: 962-963.
12. Rama Krishna Reddy Kummitha (2020) "Smart technologies for fighting pandemics: The techno- and human- driven Approaches in controlling the virus transmission" Government Information Quarterly , journal homepage 37: 101481.
13. Angelidou M (2014) Smart city policies: A spatial approach. Cities 41: S3-S11.
14. Pyzyk K (2019) No US city makes top 10 of global smart city ranking https://www.smartcitiesdive.com/news/no-us-cities-make-top-10-of-global-smart-city-ranking/564330/
15. Kamel Boulos MN, Al-Shorbaji NM (2014) On the internet of things, smart cities and the WHO healthy cities. International Journal of Health Geographics 13: 10.
16. Martinez-Balleste A, Perez-martinez PA, Solanas A (2013) The pursuit of citizens' privacy: a privacy-aware smart city is in IEEE Communications Magazine 51: 136-141.
17. Mora L, Bolici R, Deakin M (2017) The first two decades of smart-city research: A bibliometric analysis. Journal of Urban Technology 24: 3-27.
18. Kamel Boulos MN, Resch B, Crowley DN, John G Breslin, Gunho Sohn, et al. (2011) Crowdsourcing, citizen sensing and sensor web technologies for public and environmental health surveillance and crisis management: Trends, OGC standards and application examples. International Journal of Health Geographics 10: 67.
19. Janssen M, Kuk G (2016) The challenges and limits of big data algorithms in technocratic governance. Government Information Quarterly 33: 371–377.
20. Coronavirus Innovation Map December 2020 Retrieved at: https://coronavirus.startupblink.com/innovations/category/information+databases
21. Egyptian inventor trials robot that can test for COVID-19 https://

cn.reuters.com/article/instant-article/idUKKBN2852F6

22. Lauer SA, Kyra H Grantz, BA, Qifang Bi, MHS, Forrest K. Jones, MPH, Qulu Zheng, et al. (2020) The incubation period of coronavirus disease 2019 (COVID-19) from publicly reported confirmed cases: Estimation and application. Annals of Internal Medicine. https://doi.org/10.7326/M20-0504.
23. Jie S (2020) Big data, grid management support disease control in Quzhou https://www.globaltimes.cn/content/1179731.shtml
24. ElSayed A ElNashar (2017) "Antimicrobial of Volume Porosity in Nonwoven Membrane Technology for Water/Wastewater-Filtrations", EMS Publishers LLC, USA. Journal 'EMS Engineering Science Journal' 1: 005.
25. ElSayed A ElNashar (2016) Antimicrobial Bio-Nonwoven Fabrics for Eyes's Swath and Diapers for Infant's Incubators" Research & Reviews: Journal of Engineering and Technology https://www.rroij.com/peer-reviewed/antimicrobial-biononwoven-fabrics-for-eyess-swath-and-diapers-forrninfants-incubators-79857.html .
26. Wu Y, Zhang W, Shen J, Mo Z, Peng Y (2018) Smart city with Chinese characteristics against the background of big data: Idea, action and risk. Journal of Cleaner Production 173: 60-66.
27. Kennedy MT (2008) Getting counted: Markets, media, and reality. American Sociological Review 73: 270-295.
28. ElSayed Ahmed ElNashar (2017)" Antimicrobial Jetfiltrations of Membrane Technology To Water/Wastewater For The Middle-East Region "International Conference on Technics, Technologies and Education ICTTE 2017 ,19-20.
29. Servick K (2020) Cellphone tracking could help stem the spread of coronavirus. Is privacy the price? Science. https://doi.org/10.1126/science.abb8296.
30. Kelion L (2020) UK coronavirus app must respect privacy rights. https://www.bbc.co.uk/news/technology-52003984.
31. United Nations Development Program (2015) "Human Development Report", http://hdr.undp.org/en/content/human-development-report-2015
32. Hu Q, Zheng Y (2020) Smart city initiatives: A comparative study of American and Chinese cities. Journal of Urban Affairs https://doi.org/10.1080/07352166.2019.1694413.
33. Wing Sze, Tung WA (2010) "Self-Cleaning Wool: Effect of Formulation Concentration on Low Stress Mechanical and Surface Properties. Research Journal of Textile and Apparel 14: 83-88.
34. Singh AGM (2015) "Self-Cleaning Textiles: The Textiles that Clean themselves". Man Made Textiles in India 43: 14-19.
35. Photocatalytic Self-cleaning property of Titanium dioxide (https://www.technicaltextile.net).
36. Rama Krishna Reddy Kummitha (2020) "Smart technologies for fighting pandemics: The techno- and human- driven Approaches in controlling the virus transmission" Government Information Quarterly. Journal homepage: www.elsevier.com/locate/govinf
37. Carbon nanotubes (2020) https://www.researchgate.ne.
38. Zhengrong Zhang, Yuhong Li, Fan He, Yonghua Cui, Yi Zheng, et al. (2015) "Fabrication of Self-Cleaning Polyvinylidene Fluoride Film". Research Journal of Textile and Apparel 19: 48-53.