The *Merveilleux* Glove

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Contemporary Issues in the Fashion Industry

BUF 4700

Abstract

The *Merveilleux* Glove is a new, innovative, and never before seen product that is destined to change the world forever. Granted, everyone has encountered their fair share of personal protective equipment but The *Merveilleux* Glove incorporates smart textiles and advanced technology that no other protective textile product on the market has ever even imagined. Each pair of gloves comes complete with three layers that each have its role in fighting and protecting against harmful bacteria and hazardous materials. Our product can be used by anyone, from medical professionals to the average everyday germaphobe. T.M.G. (The *Merveilleux* Glove) also comes in a variety of different designs and colors, making safety fashionable. Although we are new to the market we have done countless research to guarantee that our product is safe and reliable. The *Merveilleux* Glove prides itself on helping keep our environment safe and beating germs while doing it. All of its incredible features led to its name "*merveilleux",* which means "marvelous" in French. The *Merveilleux* Glove is so ahead of its time our slogan is, "The Textile of the 22nd Century!"

The *Merveilleux* Glove

The start of this new decade has been a complete eye opener for the entire world. Globally we all have been introduced to a side of the world no one has probably ever foreseen. The Coronavirus disease, also known as COVID-19, is a contagious disease that was caused by a newly discovered strand of the coronavirus (World Health Organization, 2020). The virus was first introduced to victims in China in December of 2019, hence the name (Chow, 2020). According to the Centers for Disease and Control Prevention, i.e. CDC, as of May 16, 2020, there have been a total of 1,435,098 cases and a total of 87,315 deaths, in just the United States alone, due to the disease ("Cases in the US", 2020). The viral pandemic has affected society so much that schools have been shut down and moved virtually, some countries have restricted who and what they are allowing to enter its borders, temporary lockdown orders have been placed, and only essential businesses remain open in most places across the globe since the middle of March. The CDC claims that the best way to avoid contracting the virus is to wash your hands as often as possible, with soap and water, for at least 20 seconds ("How to Protect Yourself & Others", 2020). However, if soap and water are not immediately available the next best option is to use sanitizer that contains at least 60% alcohol ("How to Protect Yourself & Others", 2020). It is also suggested to avoid touching open areas of the body like the eyes, mouth and nose with unclean hands ("How to Protect Yourself & Others", 2020).

The *Merveilleux* Glove was invented after news spread about how personal protective equipment was becoming limited across hospitals all over the world as COVID-19 cases began rising at a dramatic rate. Medical professionals were being forced to reuse contaminated protective gear, wear expired gear or use none at all because of the huge shortage (Jacobs, Richtel, & Baker, 2020). Of course this caused several more medical workers and victims to

become at risk or get sick. This did not seem right. Doctors, nurses and other healthcare workers put their lives on the line to help those in need but they are not provided the necessary materials to keep themselves safe? We had to do something about it. The *Merveilleux* Glove became the solution.

How exactly does The *Merveilleux* Glove combat the virus? Well first, a pair of The *Merveilleux* Glove is made to be reusable for up to a month of wear which decreases the probability that there would ever be a limited supply. Reusability is unheard of in the personal protective equipment industry. There is a reason why up until now, medical gloves have usually been made of either Latex, Nitrile, Neoprene or Vinyl. According to Stonybrook University, "nitrile gloves protect against most chemicals and infectious agents" ("Environmental Health and Safety", n.d.). Neoprene and rubber gloves on the other hand provide protection against the majority of solvents and moderate corrosive materials ("Environmental Health and Safety", n.d.). However a major disadvantage of these products are that they must be disposed of. If these gloves are not thrown away after each use they can cause cross contamination and spread bacteria. Considering this these products remain very harmful to the environment because of the materials they are made from. Nitrile is a non recyclable material that can take up to several years to biodegrade (Kathy, 2020). Even Latex, which is made from the sap of rubber trees, is not eco-friendly because most disposable glove brands mix other chemicals with it in order to make products more effective (Kathy, 2020). Today there is only one brand of biodegradable disposable gloves, Showa (Kathy, 2020). Showa uses Eco Best Technology in order to get the nitrile fibers used to make its gloves biodegrade (Kathy, 2020). Unlike other disposable gloves which can take decades, Showa gloves take only five years to biodegrade (Kathy, 2020).

The *Merveilleux* Glove cuts out all these issues. T.G.M. is designed with three layers, and each layer has its own purpose for establishing a safe, reusable protective glove. The top layer (Figure 1), which is visible to all, is made of an organic cotton (Figure 2) provided by Maiwa. Maiwa is a Canadian based company that sells organic fabrics and natural dyes to artisans (Maiwa, 2020). This layer is also dyed using Maiwa natural dyes (Figure 3) to make a variety of different fun patterns for our customers to choose from, while remaining sustainable. In comparison to Showa's gloves, this organic cotton textile takes only one to five months to biodegrade (Fabric of the World, n.d.). It is also manufactured without the additive of any other chemicals, synthetic substances or pesticides unlike most disposable gloves (Fabric of the World, n.d.). This layer absorbs any microscopic organisms and germs into the second layer of the glove.

The second layer of the glove (Figure 4) is made of a speciality antimicrobial material, similar to the textiles used to make medical bedding and scrubs, which assist in killing and stopping the growth of any germs. This layer's fabric is imbued with zinc and copper oxides which have been tested and confirmed to successfully destroy viruses like COVID-19 (Veneziale, 2020). Antimicrobial textiles, unlike regular textiles, prevent bacteria from prospering in its fibers (Veneziale, 2020). These types of textiles also prolong textile life and hospitals benefit from this because replacement costs are cut down tremendously (Haddad, 2017). This middle layer takes about eight to ten minutes to fully trap any microbes that the first layer has encountered. This means although wearers will not be able to instantly touch their faces after contacting germs, bacteria will not be building up over time like it would on a regular

protective glove. Unfortunately we have not yet figured out a way to make this layer of the glove fully biodegradable without breaking harmful bacteria back into the environment.

The third layer is arguably the best. The outside of the layer (Figure 5) has a concealed packet of hand sanitizer, with 62% ethyl alcohol as an active ingredient. The packet is made out of a very thin polycarbonate plastic so that it can not be punctured or broken. Advanced technology allows, when activated, hand sanitizer to be released through mist activators from the inner part of this layer (Figure 6) directly to the skin. A frequently asked question is, "Wouldn't three layers of gloves be uncomfortable or make it easy for the hands to get hot?" The answer is "no". Around the mist activators there are fan sensors which are immediately activated once any form of moisture is sensed on the skin. These sensors can be turned on and off by the wearer as well. Bacteria grow easily in hot and moist environments which is also why this feature was added to The *Merveilleux* Glove (Veneziale, 2020). The wearer can control these features through The *Merveilleux* Glove application, available on both Android and iPhones. There is also an option for the wearer to actually see how much microbes the first layer has come in contact with if they wish. Despite the three layers, The *Merveilleux* Glove is actually thinner than the average construction glove and not that much thicker than rubber gloves. Disposable gloves typically "range from 4 to 8 mils thick" (Grainger, n.d.). T.G.M. is only 10 mils. This allows for the freedom of movement and comfort in doing any task. T.G.M. is also machine washable.

Although anyone can use The *Merveilleux* Glove, our main demographic are medical professionals. These individuals are more than likely college graduates, over 22 years of age. Depending on where they fall in the industry income can vary between $25,000 (Registered Nursing, 2020) to over $277,000 annually ("Surgeon Salary", 2020). However we plan to

primarily distribute directly to hospitals, dialysis centers, medical schools and other medical establishments. Estimated cost of each good sold, including labor and material cost, is about $10. Maiwa sells its Organic Heavyweight Cotton at $7.78 USD ($10.95 CAD) for every yard ("Cotton Organic Heavyweight", 2020). From this yard five pairs of T.G.M. can be constructed. The price of Maiwa dyes range but typically 500 grams of dye can victoriously color 5,000 units. Santizer packets go for about $0.62 for every 1,000 units (National pen, n.d.). The rest of the cost accounts for the technology and antimicrobial material. The manufacturer's suggested retail price is $49.99. With the high profit margin of 79.996% we are able to sell The *Merveilleux* Glove in a bulk of 1000 units for a distribution price of only $40,000, opposed to $49,990, without incurring any losses. Just one of these bulk units will be able to supply 83 health care workers for a whole year. These medical establishments will also be saving money in the long run seeing that a study in 2016 showed that an average of $968 worth of disposable medical supplies is wasted in just one operating procedure which is equivalent to $2.9 million a year (Castellucci, 2016).

Especially now with the COVID-19 pandemic hovering over the planet we expect The *Merveilleux* Glove to experience large levels of demand. To scale our product and to be able to meet the needs of our consumers we have decided to take a page from the Lingua Franca brand. Lingua Franca is a brand founded by Rachelle Hruska MacPherson that experienced a huge influx of orders after one of her political campaign sweaters went viral (Meltzer, 2020). MacPherson uses an e-commerce website as a way to easily expand her business and fulfill orders. Creating a website where consumers can easily purchase T.G.M. makes it easy to focus on manufacturing rather than verbally collecting sales. MacPherson also opened a space where her embroiders can work comfortably and the company can hold events (Meltzer, 2020).

Investing in a good space where our products can be produced and developing a team to help with manufacturing will definitely help our brand with scalability. Currently a lot of people are also volunteering to help make medical supplies as well. These are extra hands that can be used to help supply our gloves and meet demand.

Fair trade is really important to The *Merveilleux* Glove brand. This is why we have worked so hard to find and use materials that are sustainable and eco-friendly to develop our product. Our team will also work in fair and safe working environments and receive adequate pay for the work they do for our brand. Our high profit margin will also allow us to donate a free pair of gloves with every retail sale. The *Merveilleux* Glove is the future of textiles.

Prototype

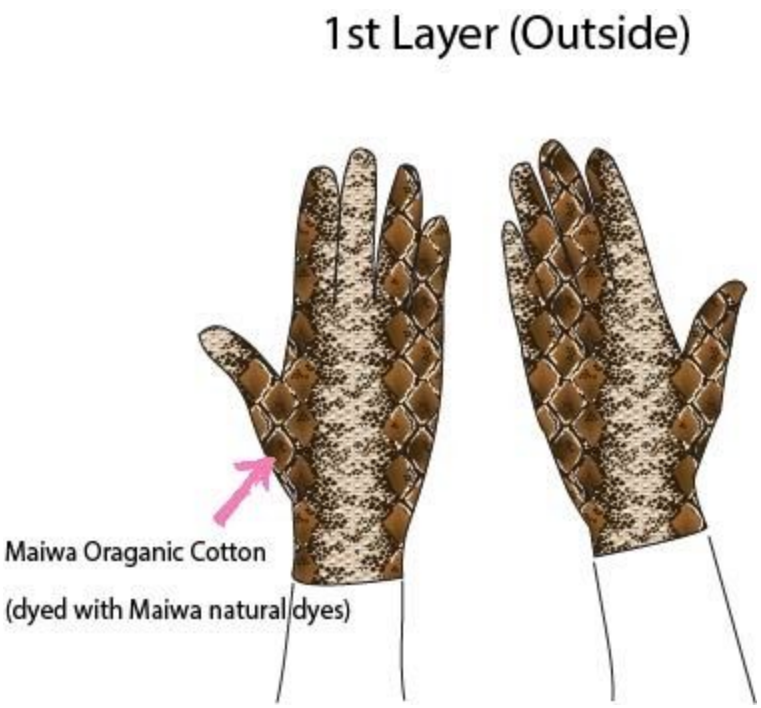

Figure 1 (Technical Design by Danielle Hueston)

Figure 2 (Maiwa Organic Cotton)

https://maiwa.com/products/fabric-cotton-organic-heavyweight?_pos=4&_sid=a4087cd74&_ss=r

Figure 3 (Maiwa Dye Used To Create Figure 1)

https://maiwa.com/collections/natural-dyes?page=3

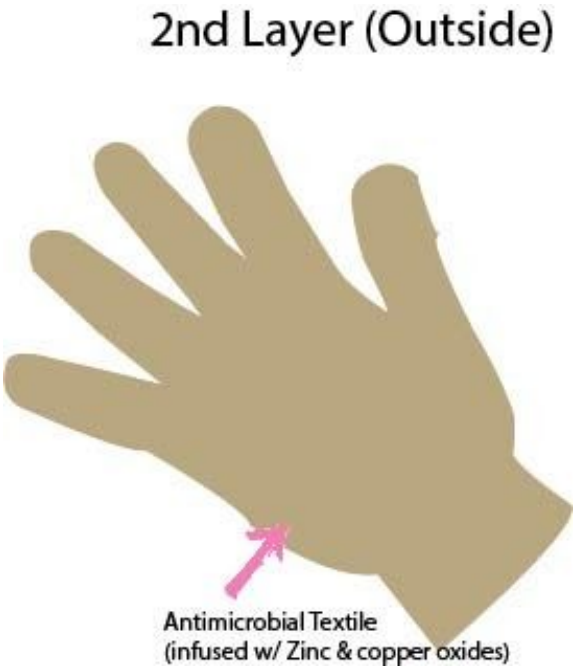

Figure 4 (Technical Design by Danielle Hueston)

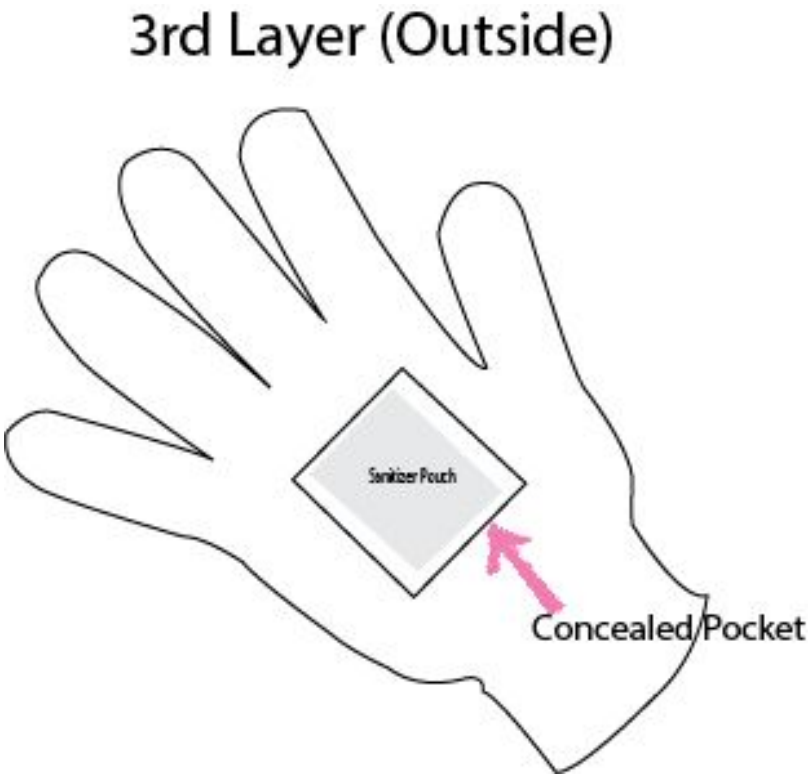

Figure 5 (Technical Design by Danielle Hueston)

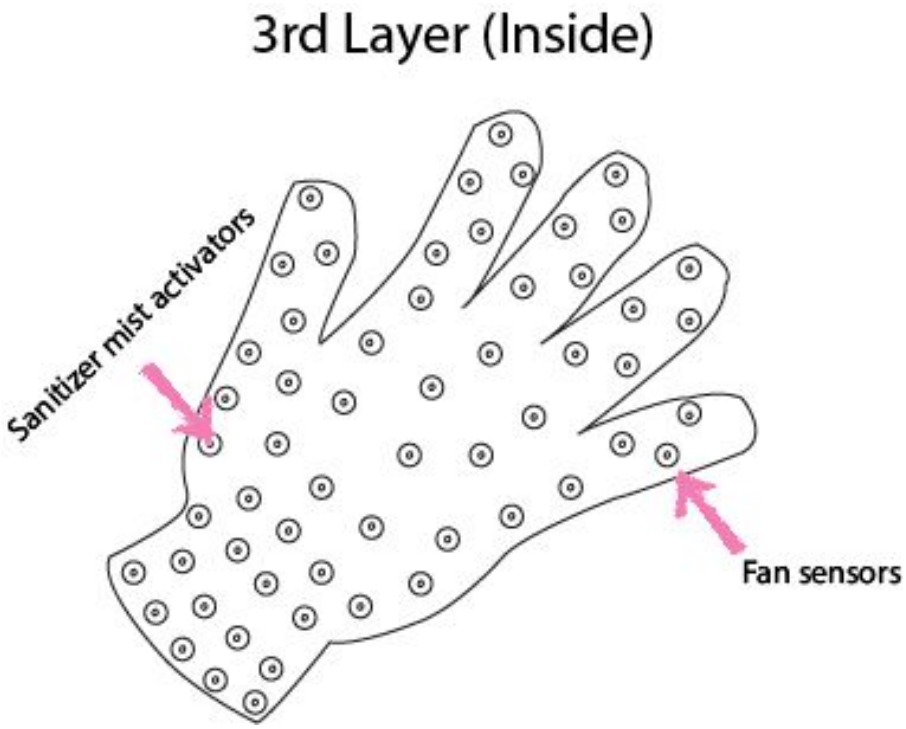

Figure 6 (Technical Design by Danielle Hueston)

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