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PUS-S045-005-P3

WEARABLE PROTECTIVE LAYER TO PROTECT SOLE OF FOOT, SOCKS WHEN WORN OR SOLE OF A SHOE

Abstract of the Disclosure

A system and method and apparatus are provided which includes a sole-shaped anti-microbial sheet made up of at least one layer having at least one adhesive backing for attaching to the sole of a foot, socks or booties, or the sole of a shoe, protected with a peel-away protective layer. The sheet may advantageously include at least one tab which is not adhesively backed to facilitate removal of the sheet by gripping using the thumb and a finger and pulling away from the sole of a foot, socks or booties, or the sole of a shoe. A wearer using the sheet to protect a sole from contact with a floor surface is able to prevent dirt, germs, bacteria, etc. from being picked-up by the sole of a foot, socks, or the sole of a shoe. When the user has completed their trajectory along a potentially unsanitary path, such as through the security line at an airport, they peel the sheet away, optionally returning to a bag provided with the packaging. The bag may optionally be the same bag, such as a ZIPLOK™ baggie, that the protective sheet of the invention was contained in at the time of purchase.

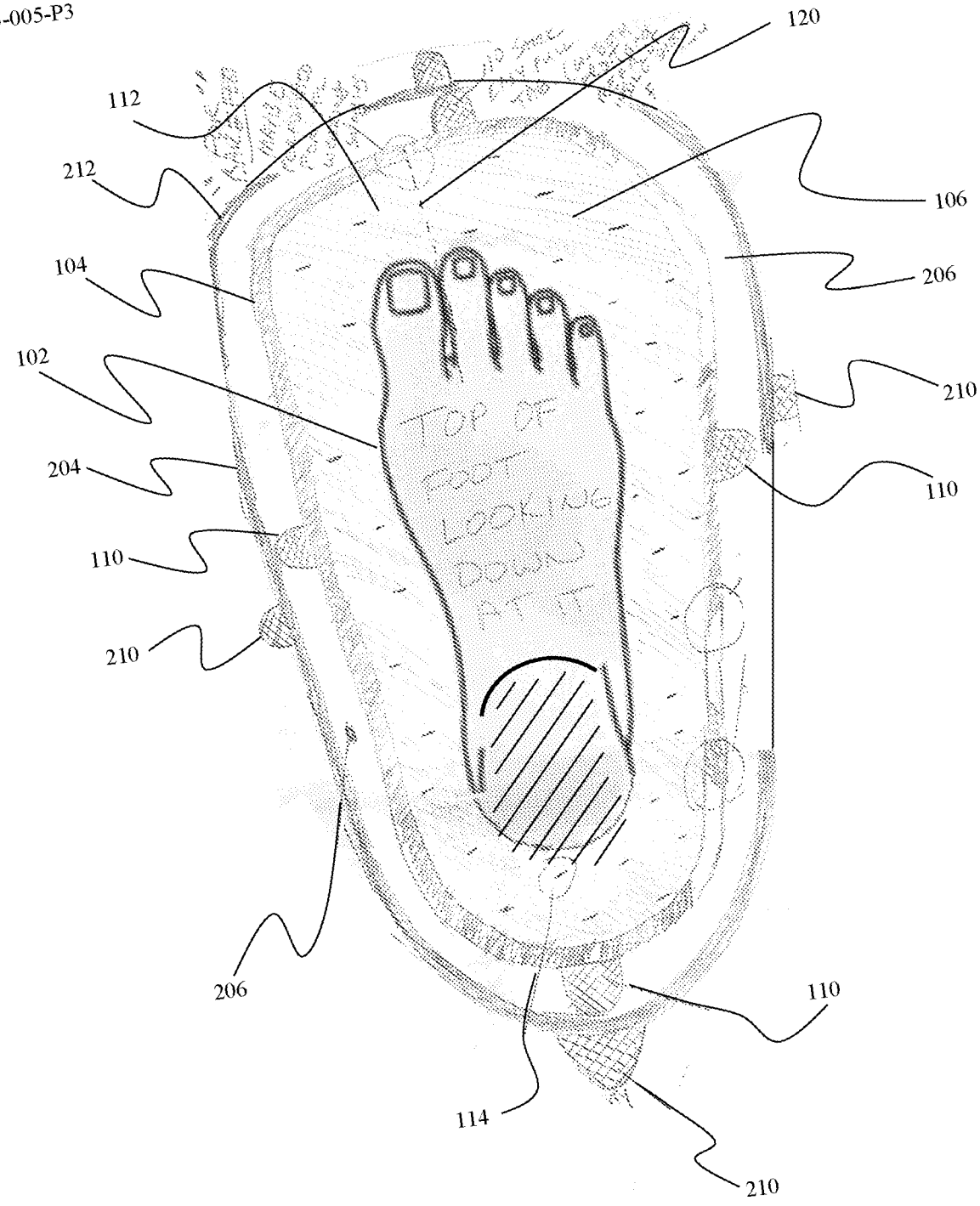

FIG. 1A

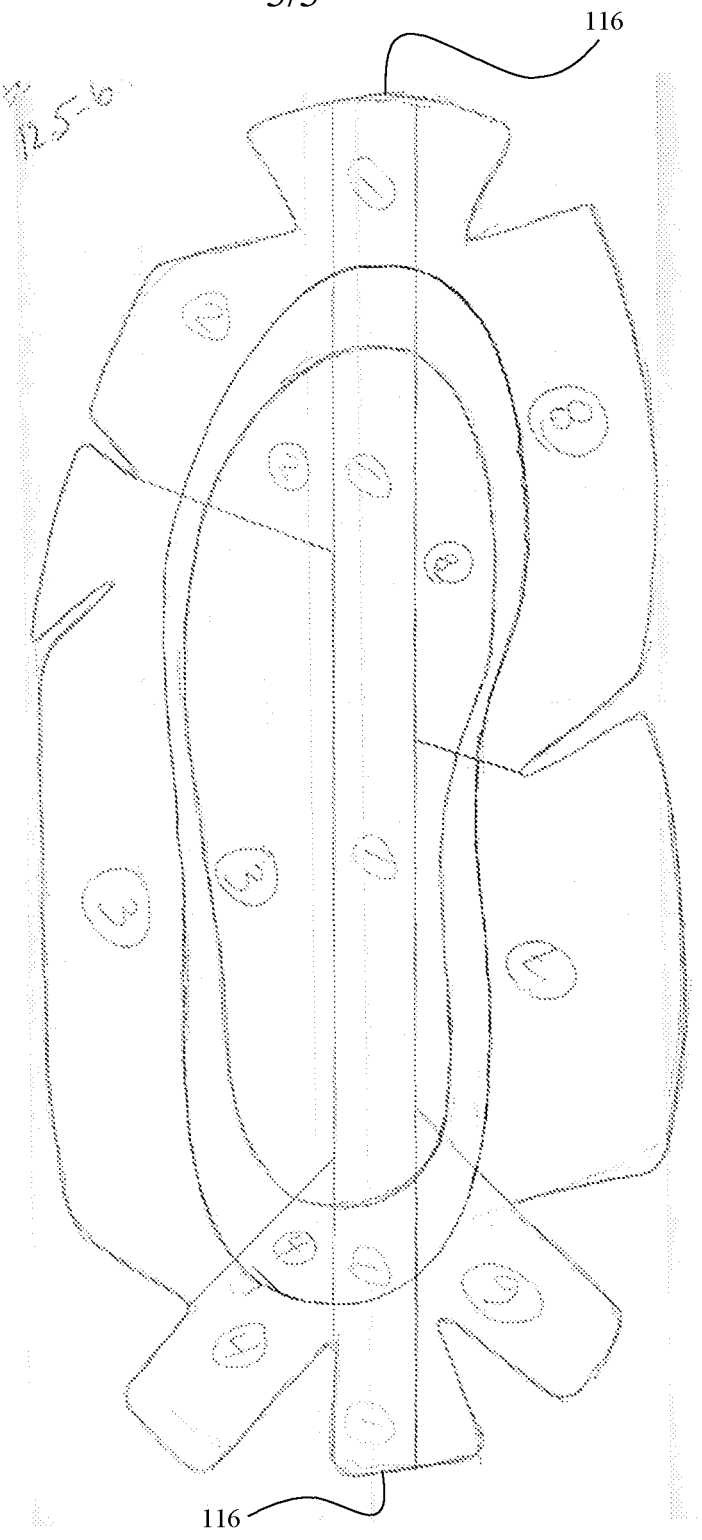

FIG. **1B**

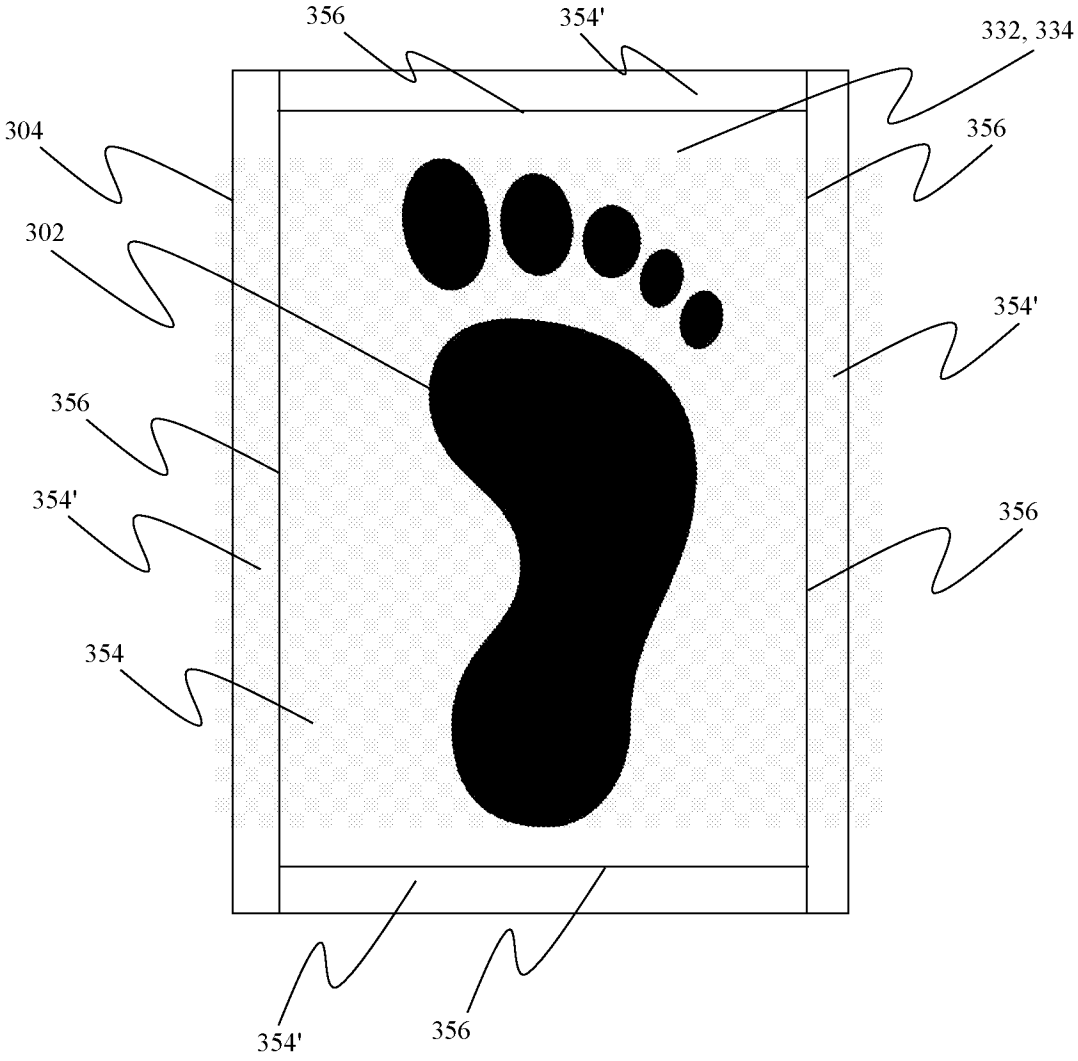

FIG. **2**

PUS-S045-005-P3

WEARABLE PROTECTIVE LAYER TO PROTECT SOLE OF FOOT, SOCKS WHEN WORN OR SOLE OF A SHOE

Cross Reference to Related Applications

This application claims the benefit of U.S. Provisional Application No. _____, filed _____ and of U.S. Provisional Application _____, filed _____, the contents of the entirety of which are explicitly incorporated herein by reference and relied upon to define features for which protection may be sought hereby as it is believed that the entirety thereof contributes to solving the technical problem underlying the invention, some features that may be mentioned hereunder being of particular importance.

Identification of parties concerned

The Applicant of the present intellectual property matter is Wearable Shoe Trees, LLC of Texas, United States. The inventor(s) of the invention described in this patent documentation is/are Paul Siragusa of Texas, United States. At the time of filing, John B. Moetteli and the firm Da Vinci Partners LLC of Switzerland represent the Applicant.

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Background of the Invention

For example, at the security checks on airports, one is typically asked by the security staff to take off its shoes before passing through a security check device. Thus, one has to walk a certain

distance without wearing shoes, i.e. walking that distance either barefoot or in socks. As a consequences, the socks or even the sole of foot is exposed to whatever dirt, germs, bacteria or the like is on the floor. One embodiment of the present invention provides a solution to that problem in that socks or soles of foot may be wrapped easily with a protective layer.

A similar problem constitutes when one is wearing shoes and must walks through an area where the floor is contaminated by whatever dirt, germs, bacteria or the like and the sole of the shoe must be protected against such dirt/germs/bacteria/… pick-up. Another embodiment of the present invention provides a solution to that problem in that soles of a shoe may be wrapped easily with a protective layer.

Summary of the Invention

A Personal Protective Equipment (PPE) system and method and apparatus is provided which includes a sole-shaped anti-microbial sheet made up of at least one layer having at least one adhesive backing for attaching to the sole of a foot, socks or booties, or the sole of a shoe, protected with a peel-away protective layer. The sheet may advantageously include at least one tab which is not adhesively backed to facilitate removal of the sheet by gripping using the thumb and a finger and pulling away from the sole of a foot, socks or booties, or the sole of a shoe. A wearer using the sheet to protect a sole from contact with a floor surface is able to prevent dirt, germs, bacteria, etc. from being picked-up by the sole of a foot, socks, or the sole of a shoe. When the user has completed their trajectory along a potentially unsanitary path, such as through the security line at an airport, they peel the sheet away, optionally returning to a bag provided with the packaging. The bag may optionally be the same bag, such as a ZIPLOK™ baggie, that the protective sheet of the invention was contained in at the time of purchase.

Brief Description of the Drawings

The attached drawings represent, by way of example, different embodiments of the subject of the invention.

FIG. **1A** shows a top view of a foot placed on an embodiment of the invention.

FIG. **1B** shows a top view of an embodiment of the invention.

FIG. **2B** shows a top view of an alternative embodiment of the invention.

Those skilled in the art will appreciate that elements in the Figures are illustrated for simplicity and clarity and have not necessarily been drawn to scale. For example, dimensions may be exaggerated relative to other elements to help improve understanding of the invention and its embodiments. Furthermore, when the terms `first`, `second`, and the like are used herein, their use is intended for distinguishing between similar elements and not necessarily for describing a sequential or chronological order. Moreover, relative terms like `front`, `back`, `top` and `bottom`, and the like in the Description and/or in the claims are not necessarily used for describing exclusive relative position. Those skilled in the art will therefore understand that such terms may be interchangeable with other terms, and that the embodiments described herein are capable of operating in other orientations than those explicitly illustrated or otherwise described.

Detailed Description of the Preferred Embodiment

The following description is not intended to limit the scope of the invention in any way as it is exemplary in nature, serving to describe the best mode of the invention known to the inventors as of the filing date hereof. Consequently, changes may be made in the arrangement and/or function of any of the elements described in the exemplary embodiments disclosed herein without departing from the spirit and scope of the invention.

There are situations when one walks barefoot or in socks and the floor, whereat this floor might be contaminated with dirt, germs, bacteria or the like. This is typically the case at security check points at airports. For example, at a security check point, one is typically asked by the security staff to take off its shoes before passing through a security check device. Thus, one has to walk a certain distance without wearing shoes, i.e. walking that distance either barefoot or in socks. As a consequence, the socks or even the sole of foot is exposed to whatever dirt, germs, bacteria

or the like is on the floor. One embodiment of the present invention provides a solution to that problem in that socks or soles of foot may be wrapped easily with a protective layer.

The invention offers the ability to:

1. Easy and quickly wrap a protective layer around socks or the sole of foot;

2. Provide optionally breathability and airflow though the protective layer via micro pores;

3. Where the protection layer is made up of several protective layers laminated together via an adhesive layer allowing peeling away of sheets, optionally with each layer having a separate tab, the exposed protective layer can be removed via the tab while exposing a fresh layer. Note that each tab can be separately numbered to ensure each successive layer is removed.

Referring now to **FIGs. 1A** and **1B**, a top view of a naked foot placed on an embodiment of the invention is shown. A naked foot 102 is placed on a first PPE device 104 according to the present invention. The first device 104 comprises a protective layer 106, at least one tab 110. An adhesive layer 112 is applied on the entire surface of the film 106 that would be adhering to the sock, foot sole or shoe sole. The adhesive layer is preferably covered by a removable foil or film. Preferably, the at least one tab 110 is an integral part of the protective layer 106, i.e. made of the same material and an extension of the main surface of the protective layer. The outer contour of the first device, optionally comprising the at least one tab 110, is preferably made by a punching process. The surface of the at least one tab 110 or the entire surface may be structured, on one or on both sides, to provide a better grip. This structure may be applied to the protective layer 106 in the area of the at least one tab 110 during the punching process. Optionally, the protective layer 106 may be perforated 114 for to provide the functionality of breathability and airflow in order to prevent the foot from sweating. The perforations 114 are located in the protective layer 106, preferably at locations where the foot or the sock is placed when worn. The perforations 114 may be applied to the protective layer 106 during the punching process. The perforations 114 may be micro pores. The perforations 114 are an optional feature and may or may not be present on the final product. The device 104 may be in slight "V-shape" for easier installation, the "V-shape" 116 being such that its propagation direction of the "V-shape" is in the direction of the foot, i.e. from

the heel part towards the toes (as shown in **FIG. 1B**). The surface of the protective layer 106 may be on one or on both sides and be adapted to stop sliding. The protective layer 106 of the invention may have a textured or non-slip bottom to prevent slipping on slick surfaces, such as blood and wet floors. This structure may be applied to the surface of the protective layer 106 during the punching process. The protective layer 106 may comprise a pre-cut or pre-perforated slitting line 120. This slitting line 120 may be applied to the protective layer 106 during the punching process.

The protective layer 106 according to the invention is made from a special plastic that is extremely strong, stretchy, durable and made with an anti-microbial material. A suitable anti-microbial film can be found on: www.silverdefender.com, a copy of this website is provided as Appendix A.

However, the anti-microbial effect is optional as benefits can be gained by use of the invention without anti-microbial treatment, when the device acts as a simple protective barrier between the user and a dirty surface.

In a variant of the above embodiment, the material of the protective layer 106 will be manufactured with anti-microbial properties all the way through it. As an effect, while walking, when the sole scrapes against the ground with each step, any plastic grinded off it will only reveal a new layer of anti-microbial surface.

In one embodiment, the PPE device 104 according to the present invention may be installed, i.e. partially wrapped over the sole and upwardly along the sides of a naked foot 102 or a foot wearing a sock (not shown). The method for installation may be described as follows:

1. Hold the front tab 110 by its “non-stick tab” and peel around half of the backing off and secure front portion to top of the toe area.

2. Line up the PPE device 104 substantially in the middle of your foot and pull the removable foil or film part all the way down your foot and up your heel and secure it.

3. Optionally, if wearing Sandler’s shoe types, stick directly to bottoms of feet and tear pre-cut or pre-perforated slitting line 120 in between big toe and pointer toe.

4. Optionally, once the invention is installed, the wearer may place its foot into a shoe.

In another embodiment, the PPE device 104 according to the present invention is made in a

thin plastic anti-microbial shoe or boot cover with a non-slip bottom and/or an elastic, the elastic being affixed to the PPE device 104 such that the elastic is situated around the ankle of a wearer when the PPE device 104 is installed. So, like a shoe cover, one may slip a shoe into such a PPE device 104 such that the PPE device 104 covers the shoe and may be worn while walking. The device 104 worn as described in the present paragraph has, for example, the effect to help stop the spread of Covid when entering venues.

In a preferred embodiment, the first device 104 is put on top of and affixed to a second device 204. The second device 204 comprising the features of the first PPE device 104, whereas the second device 204 is preferably of equal size/dimensions than the first PPE device 104, or more preferably of larger site/dimensions than the first PPE device 104 (such as exemplary shown in **FIG. 1A**).

In a variant of the above embodiment, the material of the first PPE device 104, and also of the second PPE device 204, will be manufactured with anti-microbial properties all the way through it. As an effect, while walking, when the sole scrapes against the ground on each step, any plastic grinded off it will only reveal a new layer of anti-microbial surface.

The PPE devices 104, 204 according to the above described embodiments may be installed, i.e. wrapped around a naked foot 102 or a foot wearing a sock (not shown). The method for installation may be described as follows:

1. Hold the front tab 210 by its “non-stick tab” and peel around half of the removable foil or film off and secure front portion to top of the toe area.

2. Line up the device 204 substantially in the middle of your foot and pull the removable foil or film all the way down your foot and up your heel and secure it.

3. Optionally, if wearing Sandler’s shoe types, stick directly to bottoms of feet and tear pre-cut or pre-perforated slitting line 120 in between big toe and pointer toe.

Typically for a second use of the embodiment (e.g. on a "round trip" or in a one-day scenario when one is taking the shoes off on a plane):

4. The second PPE device 204 may be separated from the first PPE device 104 by means of peeling the second PPE device 204 off and peeling the removable foil or film to secure first PPE

device 104 to the foot as described.

Referring now to **FIG. 2,** a top view of an alternative embodiment of the invention is shown. A naked foot 302 is placed on a PPE device 304 according to the present invention. The device 304 comprises a protective layer 306 spread substantially over the whole surface of the PPE device 304. An adhesive layer 312, applied on the entire surface of the layer 306, adheres to the sock, foot sole or shoe sole. The adhesive layer 312 is preferably covered by a removable paper, foil or film 354, 354'. Optionally, the removable paper, foil or film 354, 354' may be separated in individual elements by separation gaps 356. One preferred way of realizing that is shown in **Fig. 2**. However, any other arrangement of removable paper, foil or film 354, 354' and separation gaps 356 are conceivable. Optionally, the protective layer 306 may be perforated to provide the functionality of breathability and airflow in order to prevent the foot from sweating. The perforations are located in the protective layer 306, preferably at locations where the foot or the sock is placed when worn. The perforations may be applied to the protective layer 306 during the punching process. The perforations may be micro pores so as to prevent bacteria from passing therethrough. The perforations are an optional feature and may or may not be present on the final product. The device 304 may be in a slight "V-shape" for easier installation, the "V-shape" being such that its propagation direction of the "V-shape" is in the direction of the foot, i.e. from the heel part towards the toes (as exemplarily shown in **FIG. 1B**). The surface of the protective layer 306 may be on one or on both sides and be adapted to stop sliding. The protective layer 306 of the invention may have a textured or non-slip bottom to prevent slipping on slick surfaces, such as wet floors (e.g. when blood is on the floor). This structure may be applied to the surface of the protective layer 306 during the punching process. The protective layer 306 may comprise a pre-cut or pre-perforated slitting line (as exemplarily shown in **FIG. 1B**). This slitting line may be applied to the protective layer 306 during the punching process. The protective layer 306 may comprise an extended length 332 in the front area 334 to allow one to pull it over the front of the toe box of the shoe as well as the “laces area”. This will protect the bottom and top of a wearer's footwear that are prone to bacteria and airborne particles falling on them. The PPE sole shield can remain on the bottom and extend over the top of the wearer's shoe, e.g. until one leaves the hospital, airport or other

potentially infected location. Then the wearer can dispose of them being confident that the wearer's feet hasn't transported any harmful germs, bacteria, viruses or the like on the bottom or the top.

The protective layer 306 according to the invention is made from a special plastic that is extremely strong, stretchy, durable and made with an anti-microbial material. A suitable anti-microbial film can be found on: www.silverdefender.com, a copy of this website is provided as Appendix A. However, the anti-microbial effect is optional as benefits can be gained by use of the invention without anti-microbial treatment, when the device acts as a simple protective barrier between the user and a dirty surface.

In a variant of the above embodiment, the material of the protective layer 306 will be manufactured with anti-microbial properties all the way through it. As a result, while walking, when the sole scrapes against the ground on each step, any plastic ground or worn off it will only reveal a new layer of anti-microbial surface.

In one embodiment, the PPE device 304 according to the present invention may be installed, i.e. partially wrapped over the sole and upwardly along the sides of a naked foot 302 or a foot wearing a sock (not shown). The method for installation may be described as follows:

1. Peel the center of the removable paper, foil or film 354 backing off of the adhesive film 312. The sides, front and rear removable paper, foil or film 354' may have a thin border used to keep the flimsy protective layer 306 in a "flat position" for easy installation.

2. The removable paper, foil or film 354' will be peeled off after the user places his foot 302 in the center of the exposed adhesive film 312 of the protective layer 306. The boarders of removable paper, foil or film 354' left on the edges of the protective film 306 will act as borders that keep the very thin protective layer 306 straight and prevent it from folding on its self and sticking to its self.

3. After the user places his foot 302, preferably directly in the center of the adhesive 312, they will then remove the removable paper, foil or film 354' by peeling them off the same way as they did the center piece 354 that originally exposed the adhesive 312. Once the removable paper, foil or film 354' are peeled off, the so laid open areas of the adhesive film 312, can be stuck or adhered to the sides of your foot 302 and top of toes and up the heal of the foot 302.

4. Optionally, once the invention is installed, the wearer may place his foot into a shoe.

In another embodiment, the PPE devices 104, 204, 304 according to the present invention are made in a thin plastic anti-microbial shoe or boot cover with a non-slip bottom and/or an elastic, the elastic being affixed to the PPE devices 104, 204, 304 such that the elastic is situated around the ankle of a wearer when the PPE devices 104, 204, 304 are installed. So, like a shoe cover, one may slip a shoe into such PPE devices 104, 204, 304 such that the PPE devices 104, 204, 304 cover the shoe and may be worn while walking. The PPE devices 104, 204, 304 worn as described in the present paragraph have, for example, the effect to help stop the spread of Covid when entering venues.

In another preferred embodiment, a third PPE device (not shown) is affixed to the second PPE device 204, such that the embodiment comprises three devices. The third PPE device is affixed to the second PPE device in the same manner as the second PPE device 204 is affixed to the first PPE device 104. Further preferred embodiments, adding even further devices in the same manner, are within the scope of the invention.

In a variant of the above embodiment, the material of all the PPE devices will be manufactured with anti-microbial properties all the way through it. As an effect, while walking, when the sole scrapes against the ground on each step, any plastic grinded off it will only reveal a new layer of anti-microbial surface.

The embodiments as described above may be affixed to the bottom of a shoe, preferably of a medical shoe, instead of a naked foot 102 or a foot wearing sock(s) as provided above. One of the herein-described embodiments may preferably be affixed to the bottom of a medical shoe when you walk into a hospital. The embodiments can e.g. be made disposable when entering or leaving a hospital.

The present invention is suitable for various types of footwear. From sneakers/shoes, medical shoes to sandals or flip flops.

The embodiments, when installed on a foot, on a foot wearing sock(s), or on a shoe may last for 24 hours or any other time.

In another variant of the above embodiments, the material of the PPE devices may be

perforated through out to be able to easily tear at certain lengths (small ,medium and large) for a one size fits all feature and benefit.

In another variant of the above embodiments, the may be scented for a fresh smell at time of install.

In another variant of the above embodiments, the embodiment is specifically designed for the sole of footwear. This film has a permanent and waterproof adhesive and consists of a thicker anti-microbial protective film with a textured non-slip bottom. When you wear these permanent PPE sole protectors, the anti-microbial layer of the film will easily wipe of germs, bacteria and the like when the user wipes his feet on a door mat. A mat more suited for this type of wiping may be designed but will work on any regular door mat. The user would wipe off their feet on the door mat and the anti-microbial film will easily transfer germs from the protective film to the door mat leaving most of the germs on the mat, and not dragging them inside of the home for instance. This anti-microbial feature would last for up to 90 days. It is possible to remove the permanent PPE sole protector by exposing it to heat from a heat gun or hot hair dryer. By applying heat it will break down the glue and make it easily removable.

The embodiments, when installed on a foot wearing sock(s), may comprise at least one front tab to avoid pulling socks off.

A detailed description on how the invention works is now provided. The invention may be of a rectangular shape or cut to a dedicated shape as exemplary provided in the figures. They will be wider and longer than the actual projected surface of a foot or shoe so they may be wrapped around the foot or shoe to create an air tight fit. Logos, of sports teams, for example, may be printed on the PPE device of the invention. A user simply peels off the removable foil or film and carefully applies the adhesive side to the foot, sock or shoe. It may be flattened out with the user's fingers so there are substantially no air bubbles in it. Then the excess film is wrapped around the foot, sock or shoe. For sandals or flip flops there is a perforated slitting line 120 in between the big toe and pointer toe to allow for the piece of the sandal that is disposed in between those specific toes. This may be pre made at the factory or the consumer may simply cut the invention to accommodate

for that piece of the sandal.

The user peels the removable foil or film from the invention and applies the invention to the foot, sock or shoe they desire to protect.

A suitable anti-microbial film can be found on: www.silverdefender.com, a copy of this website is provided as Appendix A.

When socks or the sole of the foot are exposed to the dirt germs, bacteria, viruses or the like is on the floor, these germs will then contaminate a damp sweaty sock and become embedded into the sock and pass through the sock, and into the open pores on the sole of the foot leaving the person at a great risk of being infected. After walking through airport security screening, the person will have to then put their shoes back on and their socks will now contaminate the inside of their shoes. The heat from one's feet will create an incubator atmosphere for the germs, bacteria, viruses etc. to stay alive and get one sick by entering the open pores on one's sweaty feet. When a foot sweats in the sock, one's pores remain open and this creates an entrance into your bloodstream for bacteria, germs, viruses or the like, to enter into the body and so ultimately, he/she gets contaminated.

A further advantage provided by this invention is to keep the bottoms of socks free from bacteria so when one finally arrives at home and takes off one's shoes, one does not spread the bacteria and germs that have been incubating in the socks all day onto the carpet or floor. There is the risk that young children may be playing on it when they crawl on the contaminated floor thereby becoming exposed to these germs just tracked in. Then, by touching the germs on the floor and then touching their eyes or mouth will leave them at great risk for becoming infected. This can be avoided when wearing the PPE device according to the invention as described herein.

It should be appreciated that the particular implementations shown and herein described are representative of the invention and its best mode and are not intended to limit the scope of the present invention in any way.

In further detail, in one embodiment, the plastic film 106 is infused with anti-microbial that has at least one adhesively-backed side 112, 312 that will adhere to the sole of a person’s footwear.

Optionally, the film 106 may be cut at the end of the front of the shoe or extended approximately 3 to 10 inches past the front of the footwear to be able to pull the access film back towards you and over the laces to clean them and shield them from germs, viruses. bacteria and Covid droplets.

The film 106 is preferably wider and longer then then the sole to which it is sized to make sure it covers the entire sole as well as covering a portion of the sides and front and rear of the wearer's footwear.

Optionally, in an embodiment conceived many months ago, an adhesive film 112 may be applied to both sides of the film 106, thereby providing a tacky non-slip surface (optionally covering only a portion of the surface in a zig-zag or show shoe grip pattern). The film's tackiness serves as a non-slip feature ensuring the user does not slip after application of the product when walking. The exteriorly disposed tacky (i.e. adhesive) layer on the film 106 has the added benefit of picking up the bacteria and germs up off of the floor and sticking them to the tacky side 112, 312 of the film 106. The longer the germs stay on the film, the more die. Still further, visually, the tacky 112, 312 side will become soiled and so show the user what amount of dirt and germs the film 106 protects him or her against.

As already described, the film 106 may optionally be die cut into sheets that have at least one side attached to a removable release liner 354, 354' that is removed prior to adhering to sole of footwear. The release liner 354, 354' is designed to prevent drying out of the adhesive layer 312 and to prevent sticking before the film 106 is ready for adhering to the foot, sock or shoe.

Note that the composition of the adhesive layer directed toward the sole, sock or foot may have a different composition than that of the adhesive layer directed outwardly. This is because the function of each respective layer is different. The inwardly directed adhesive layer is intended to attach, in an easily removable manner, the film to the shoe, sock or foot. The outwardly directed layer is designed to provide slip-resistance and to clean the floor of germs. Consequently, the level of adhesion and the amount of anti-microbial to be impregnated in the film varies.

In this and all other embodiments herein described, the antimicrobial lining of the film may be bonded to a conventional, clear polyethylene plastic typically used to vacuum-package foods.

This anti-microbial lining can optionally be a pullulan-based biopolymer produced from starch syrup during a fermentation process, which is already approved for use in foods. Pullulan, a water-soluble "polysaccharide," is essentially a chain of sugar, glycerin and cellulose molecules linked together. The adhesive layer applied thereon can be a low-strength adhesive or even a layer inducing static electricity such as found in 3M POST-IT® note products. A Pressure Sensitive Acrylate (PSA) provides the ability to stick and re-stick, adhering to most surfaces, and then to be easily removed without being torn apart and without leaving residues of adhesive on the substrate. Because of the different natures of the anti-microbial layer and the adhesive layer, these may be applied to different portions of the surfaces of one or both sides of the film so as to allow dual functionality.

Still further, when the film is removed from the sole, or sock or foot, the anti-microbial will have killed bacteria and germs on the sole, sock or foot, and the sticky adhesive will also pull off most of the germs on the bottoms of your shoes, socks or feet, leaving your soles, socks or feet cleaner than they were before the film of the invention was installed.

Optionally, in another embodiment, the antimicrobial film 106 need not have an adhesive backing on either side but instead may be manufactured on a roll and dispensed from an auto shoe cover machine such as BOOTIE-BUTLER™, described on https://www.uline.com/BL_1208/Bootie-Butler?pricode=WA3825, attached in the **Appendix B** hereto. In this embodiment, an anti-microbial, adhesive layer, optionally structured for grip, is advantageously applied to the bottom of each bootie dispensed, with a release layer optionally placed therebetween.

In another embodiment, in more compact form, the film of the invention can be dispensed using the Quen automatic shoe cover machine at https://www.quen-techs.com/news/why-choose-quen-automatic-shoe-cover-machine-22734285.html, also attached in the **Appendix C** hereto. Optionally both sides of the film can have an anti-microbial adhesive layer applied where a release layer(s) may be optional.

The anti-microbial film is typically based on polyvinylidene chloride (PVC) or made of low density polyethylene (LDPE). These coatings may be impregnated with a Zinc or Silver oxide,

even small copper particles, thereby created a composite film. Alternatively, such a plastic can be coated with an anti-microbial film. A suitable antimicrobial film-forming composition may be made up of no greater than 10 weight percent of polyvinyl alcohol, from 0.05 to 15 weight percent of polyhexamethylene biguanide, from 0.001 to 10 weight percent of a quaternary ammonium compound, and water or a water-based solvent. The film-forming composition can form a water-soluble, biocidal antimicrobial film that includes no greater than 98 weight percent of polyvinyl alcohol, and from 1 to 15 weight percent of each of polyhexamethylene biguanide and the quaternary ammonium compound. The film-forming composition is applied to the plastic film to create the anti-microbial film and may optionally include an indicator dye to make the anti-microbial film more visible to the user. Service provider BioCote® Ltd of the UK helps with specifying an appropriate antimicrobial additive for any particular application. They have a wizard available at https://www.biocote.com/make-my-product-antimicrobial/ to enable customers to help specify a particular anti-microbial film.

Clara Silvestre et al. describe in their article the "Development of Antibacterial Composite Films Based on Isotactic Polypropylene and Coated ZnO Particles for Active Food Packaging, also attached in the **Appendix D** hereto.

In an advantage, a wearer using the sheet to protect a sole from contact with a floor surface is able to prevent dirt, germs, bacteria, etc. from being picked-up by the sole of a foot, socks, or the sole of a shoe.

Benefits, other advantages and solutions mentioned herein are not to be construed as critical, required or essential features or components of any or all the claims, herein incorporated by reference.

As will be appreciated by skilled artisans, the present invention may be embodied as a system, a device, or a method.

Moreover, the system contemplates the use, sale and/or distribution of any goods, services or information having similar functionality described herein.

The specification and figures should be considered in an illustrative manner, rather than a restrictive one and all modifications described herein are intended to be included within the scope

of the invention claimed. Accordingly, the scope of the invention should be determined by the appended claims (as they currently exist or as later amended or added, and their legal equivalents) rather than by merely the examples described above. Steps recited in any method or process claims, unless otherwise expressly stated, may be executed in any order and are not limited to the specific order presented in any claim. Further, the elements and/or components recited in apparatus claims may be assembled or otherwise functionally configured in a variety of permutations to produce substantially the same result as the present invention. Consequently, the invention should not be interpreted as being limited to the specific configuration recited in the claims.

As used herein, the terms "comprises", "comprising", or variations thereof, are intended to refer to a non-exclusive listing of elements, such that any apparatus, process, method, article, or composition of the invention that comprises a list of elements, that does not include only those elements recited. Unless otherwise explicitly stated, the use of the term “consisting” or “consisting of” or “consisting essentially of” is not intended to limit the scope of the invention to the enumerated elements named thereafter, unless otherwise indicated. Other combinations and/or modifications of the above-described elements, materials or structures used in the practice of the present invention may be varied or adapted by the skilled artisan to other designs without departing from the general principles of the invention.

For example, a thicker, puncture resistant (e.g., using nylon, Kevlar or other suitable material layer), reinforced, and hypoallergenic yet flexible version may be provided to protect a barefoot user when the invention is directly attached to the user’s foot. When one walks barefoot, one is extremely susceptible to contamination by poisons, viruses or bacteria found on the floor or on the ground where people sometimes discharge body fluids, fluids which may contain dangerous pathogens.

The patents and articles mentioned above are hereby incorporated by reference herein, unless otherwise noted, to the extent that the same are not inconsistent with this disclosure.

The invention can be summarized by the following feature sets.

1. A Personal Protective Equipment device is provided which includes a sole-shaped anti-microbial sheet made up of at least one layer having at least one adhesive (i.e., tacky) backing for attaching to the sole of a foot, socks or booties, or the sole of a shoe, protected with a peel-away protective layer.

2. The Personal Protective Equipment device of feature set 1, wherein the anti-microbial properties are all the way through the at least one layer.

3. The Personal Protective Equipment device of any of above feature sets, wherein the bottom of the layer will be textured for non-slip, wherein the texture may be applied to the layer after the layer is manufactured or built into the film at the time the layer is manufactured.

4. The Personal Protective Equipment device of any of above feature sets, wherein the sheet comprises an extended length 332 in the front area 334 to allow a wearer to pull it over the front of the toe box of the she as well as the “laces area”.

5. The Personal Protective Equipment device of any of above feature sets, wherein the material of the anti-microbial sheet is perforated through out to be able to easily tear at certain lengths (small ,medium and large) for a one size fits all feature and benefit.

6. The Personal Protective Equipment device of any of above feature sets, wherein the sheet may be scented for a fresh smell at time of install.

7. The Personal Protective Equipment device of any of above feature sets, wherein the anti-microbial sheet has a permanent and waterproof adhesive and consists of a thick anti-microbial protective material with a textured non-slip bottom.

8. The Personal Protective Equipment device of any of above feature sets, wherein the sheet may advantageously include at least one tab which is not adhesively backed to facilitate removal of the sheet by gripping using the thumb and a finger and pulling away from the sole of a foot, socks or booties, or the sole of a shoe.

9. A Personal Protective Equipment protective layer device, the protective layer device being a plastic film and having anti-bacterial properties, the protective layer device being precut such to be installable/wrappable around a sole of foot, a sock when worn by a wearer or a sole of shoe, the protective layer device comprising at least one tab and an adhesive layer applied on the peripherical aera of the device, which prevents particles, such as dirt, germs and bacteria, from being picked-up by the sole of foot, socks, or sole of shoe.

10. The Personal Protective Equipment protective layer device of feature set 9 providing breathability and airflow through the protective layer.

11. The Personal Protective Equipment protective layer device of feature set 9, wherein the adhesive layer is spaced apart for easier removal.

12. The Personal Protective Equipment protective layer device of feature set 9, wherein the at least one tab is structured on one or on both sides.

13. The Personal Protective Equipment protective layer device of feature set 9, wherein the device is slightly "V-shaped" in the direction of the foot.

14. The Personal Protective Equipment protective layer device of feature set 9, wherein the plastic film is a special plastic that is extremely strong, stretchy, durable, and made with an anti-microbial material.

15. The Personal Protective Equipment protective layer device of feature set 9, wherein the device is made in a thin plastic anti-microbial shoe or boot cover with a non-slip bottom and/or an elastic, the elastic being affixed to the device 104 such that the elastic is situated around the ankle of a wearer when the device 104 is installed.

16. A method for installation of the invention of any of the above device feature sets, the method including the following steps:

a) hold the front tab 110 by its "non-stick tab" and peel around half of the backing off and secure front portion to top of the toe area,

b) line up the device 104 substantially in the middle of a foot and pull the removable foil or film part all the way down the foot and up the heel and secure it, and

c) optionally, if wearing Sandler's shoe types, stick directly to bottoms of feet and tear pre-cut or pre-perforated slitting line 120 in between big toe and pointer toe.

17. A method for installation of the invention of any of the above device feature sets, the method wrapping the invention around a portion of a naked foot 102 or a foot wearing a sock, the method including the following steps:

a) hold the front tab 210 by its "non-stick tab" and peel around half of the removable foil or film off and secure front portion to top of the toe area;

b) line up the device 204 substantially in the middle of your foot and pull the removable foil or film all the way down your foot and up your heel and secure it; and

c) optionally, if wearing Sandler's shoe types, stick directly to bottoms of feet and tear pre-cut or pre-perforated slitting line 120 in between big toe and pointer toe.

18. A method of packaging the device of feature set 1, wherein a resealable, preferably transparent baggie is used to contain the system at the point of sale, such baggie being reusable to dispose of the system after use, the baggie comprising optionally a

ZIPLOK™.

19. A method for installation of the invention of any of the above device feature sets, the method wrapping the invention around a portion of a naked foot 302 or a foot wearing a sock, the method including the following steps:

a) peel the center of the removable paper, foil or film 354 backing off of the adhesive film 312;

b) the user places his foot 302 in the center of the now exposed adhesive film 312 of the protective layer 306, thereby the removable paper, foil or film 354' stay on the edges of the protective film 306 and act as borders that keep the very thin protective layer 306 straight and prevent it from folding on its self and sticking to its self;

c) remove the removable paper, foil or film 354' by peeling them off;

d) stick the so laid open areas of the adhesive film 312 to the sides of the foot 302 and top of toes and up the heal of the foot 302; and

e) optionally, once the invention is installed, the wearer may place its foot into a shoe.

Other characteristics and modes of execution of the invention are described in the appended claims.

Further, the invention should be considered as comprising all possible combinations of every feature described in the instant specification, appended claims, and/or drawing figures which may be considered new, inventive and industrially applicable.

Additional features and functionality of the invention are described in the claims appended hereto and/or in the abstract. Such claims and/or abstract are hereby incorporated in their entirety by reference thereto in this specification and should be considered as part of the application as filed.

Multiple variations and modifications are possible in the embodiments of the invention described here. Although certain illustrative embodiments of the invention have been shown and described here, a wide range of changes, modifications, and substitutions is contemplated in the

foregoing disclosure. While the above description contains many specific details, these should not be construed as limitations on the scope of the invention, but rather exemplify one or another preferred embodiment thereof. In some instances, some features of the present invention may be employed without a corresponding use of the other features. Accordingly, it is appropriate that the foregoing description be construed broadly and understood as being illustrative only, the spirit and scope of the invention being limited only by the claims which ultimately issue in this application.

Claims

What is Claimed Is:

1. A Personal Protective Equipment device is provided which includes a sole-shaped anti-microbial sheet made up of at least one layer having at least one adhesive backing for attaching to the sole of a foot, socks or booties, or the sole of a shoe, protected with a peel-away protective layer.

2. The Personal Protective Equipment device of claim 1, wherein the anti-microbial properties are all the way through the at least one layer.

3. The Personal Protective Equipment device of any of above claims, wherein the bottom of the layer will be textured for non-slip, wherein the texture may be applied to the layer after the layer is manufactured or built into the film at the time the layer is manufactured.

4. The Personal Protective Equipment device of any of above claims, wherein the sheet comprises an extended length 332 in the front area 334 to allow a wearer to pull it over the front of the toe box of the she as well as the “laces area”.

5. The Personal Protective Equipment device of any of above claims, wherein the material of the anti-microbial sheet is perforated through out to be able to easily tear at certain lengths (small ,medium and large) for a one size fits all feature and benefit.

6. The Personal Protective Equipment device of any of above claims, wherein the sheet may be scented for a fresh smell at time of install.

7. The Personal Protective Equipment device of any of above claims, wherein the anti-microbial sheet has a permanent and waterproof adhesive and consists of a thick anti-microbial protective material with a textured non-slip bottom.

8. The Personal Protective Equipment device of any of above claims, wherein the sheet may advantageously include at least one tab which is not adhesively backed to facilitate removal of the sheet by gripping using the thumb and a finger and pulling away from the sole of a foot, socks or booties, or the sole of a shoe.

9. A Personal Protective Equipment protective layer device, the protective layer device being a plastic film and having anti-bacterial properties, the protective layer device being precut such to be installable/wrappable around a sole of foot, a sock when worn by a wearer or a sole of shoe, the protective layer device comprising at least one tab and an adhesive layer applied on the peripherical aera of the device, which prevents particles, such as dirt, germs and bacteria, from being picked-up by the sole of foot, socks, or sole of shoe.

10. The Personal Protective Equipment protective layer device of claim 9 providing breathability and airflow through the protective layer.

11. The Personal Protective Equipment protective layer device of claim 9, wherein the adhesive layer is spaced apart for easier removal.

12. The Personal Protective Equipment protective layer device of claim 9, wherein the at least one tab is structured on one or on both sides.

13. The Personal Protective Equipment protective layer device of claim 9, wherein the device is slightly "V-shaped" in the direction of the foot.

14. The Personal Protective Equipment protective layer device of claim 9, wherein the plastic film is a special plastic that is extremely strong, stretchy, durable, and made with an anti-microbial material.

15. The Personal Protective Equipment protective layer device of claim 9, wherein the device is made in a thin plastic anti-microbial shoe or boot cover with a non-slip bottom and/or an elastic, the elastic being affixed to the device 104 such that the elastic is situated around the ankle of a wearer when the device 104 is installed.

16. A method for installation of the invention of any of the above device claims, the method including the following steps:

a) hold the front tab 110 by its "non-stick tab" and peel around half of the backing off and secure front portion to top of the toe area,

b) line up the device 104 substantially in the middle of your foot and pull the removable foil or film part all the way down your foot and up your heel and secure it, and

c) optionally, if wearing Sandler's shoe types, stick directly to bottoms of feet and tear pre-cut or pre-perforated slitting line 120 in between big toe and pointer toe.

17. A method for installation of the invention of the above claim, the method wrapping the invention around a portion of a naked foot 102 or a foot wearing a sock, the method including the following steps:

a) hold the front tab 210 by its "non-stick tab" and peel around half of the removable foil or film off and secure front portion to top of the toe area;

b) line up the device 204 substantially in the middle of your foot and pull the removable foil or film all the way down your foot and up your heel and secure it; and

c) optionally, if wearing Sandler's shoe types, stick directly to bottoms of feet and tear pre-cut or pre-perforated slitting line 120 in between big toe and pointer toe.

18. A method of packaging the device of claim 1, wherein a resealable, preferably transparent baggie is used to contain the system at the point of sale, such baggie being reusable to dispose of the system after use, the baggie comprising optionally a ZIPLOK™.

19. A method for installation of the invention of any of the above device claims, the method wrapping the invention around a portion of a naked foot 102 or a foot wearing a sock, the method including the following steps:

a) peeling the center of the removable paper, foil or film 354 backing off of the adhesive film 312;

b) placing the user's foot 302 in the center of the now exposed adhesive film 312 of the protective layer 306, thereby the removable paper, foil or film 354' stay on the edges of the protective film 306 and act as borders that keep the very thin protective layer 306 straight and prevent it from folding on its self and sticking to its self;

c) removing the removable paper, foil or film 354' by peeling them off;

d) sticking the so laid open areas of the adhesive film 312 to the sides of a foot 302 and top of toes and up the heal of your foot 302; and

e) optionally, once the invention is installed, the wearer placing his foot into a shoe.

20. The system(s) and/or method(s) as described in the instant specification, dependent claims, abstract (herein incorporated by reference), and/or drawing figures.

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Doc Code: CV19.PUB.PRO
Document Description: COVID-19 Collab Database Request for Prov Appl

PTO/SB/452 (09-20)

CERTIFICATION AND REQUEST FOR COVID-19 PROVISIONAL PATENT APPLICATION PROGRAM

(Page 1 of 1)

First Named Inventor:	SIRAGUSA, Paul
Title of Invention:	WEARABLE PROTECTIVE LAYER TO PROTECT SOLE OF FOOT, SOCKS WHEN WORN OR SOLE OF A SHOE
Contact information to include in database (optional)	

APPLICANT HEREBY MAKES THE FOLLOWING CERTIFICATIONS AND REQUESTS THAT THE USPTO INCLUDE THE DESCRIPTION OF THE ACCOMPANYING PROVISIONAL PATENT APPLICATION IN A PUBLIC DATABASE.

1. The description of the accompanying provisional patent application concerns a product or process relating to COVID-19 and such product or process is subject to an applicable FDA approval for COVID-19 use.

2. The accompanying application is in the English language.

3. The accompanying application is being filed in DOCX format via the USPTO's Patent Center filing system, together with this form.

4. The applicant understands that while the required filing fee for the accompanying provisional application may be deferred by acceptance into this program, the appropriate filing fee must be paid in order for a subsequent U.S. nonprovisional application to claim the benefit of the filing date of the accompanying provisional application. Applicant recognizes that the filing fee due in the future may be more than the current fee due and that by deferring payment of the filing fee, there may be an increase in the total fee due.

5. Applicant authorizes and requests that the description, including the specification and any drawings, claims and/or abstract of the accompanying provisional patent application, as well as this form, be included in a searchable online public database.

6. Applicant understands that inclusion in the public database is a publication of the description and this form.

Signature /s john moetteli/	Date Aug. 18, 2021
Name (Print/Typed) John MOETTELI	Practitioner Registration Number 35,289

*Note: This form must be signed in accordance with 37 CFR 1.33. See 37 CFR 1.4(d) for signature requirements and certifications. Submit multiple forms if more than one signature is required.**

☐ *Total of ..... forms are submitted.