



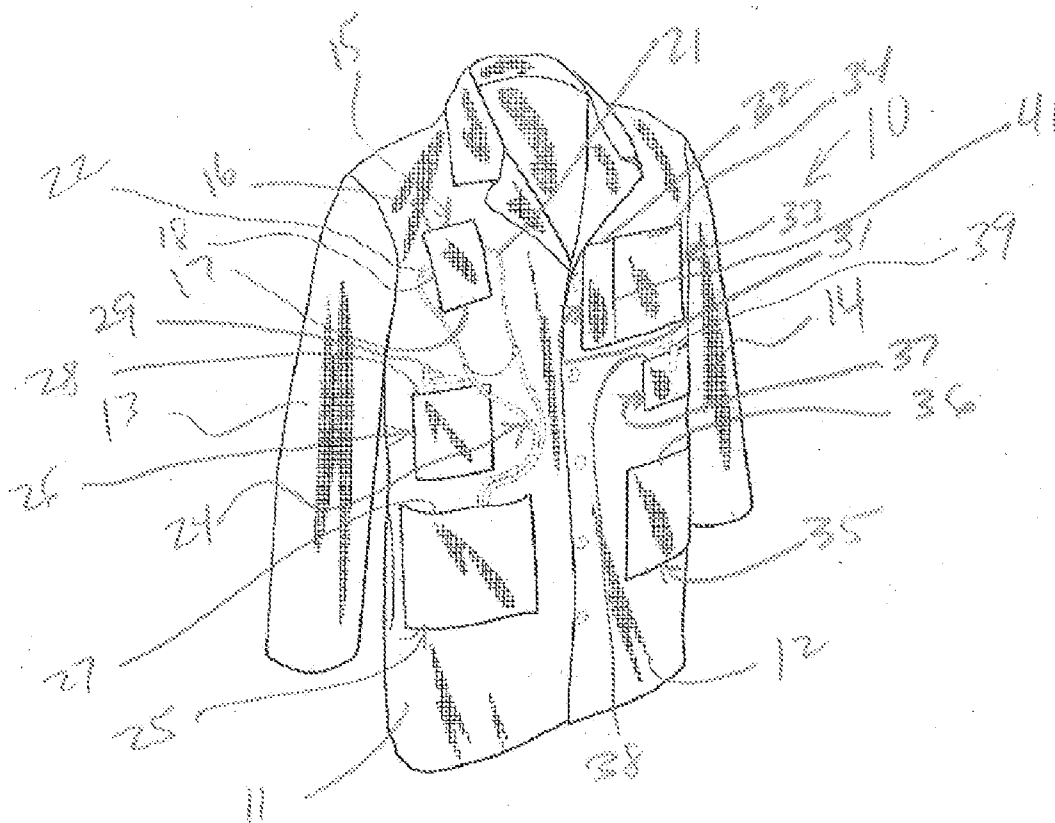
US 20120030851A1

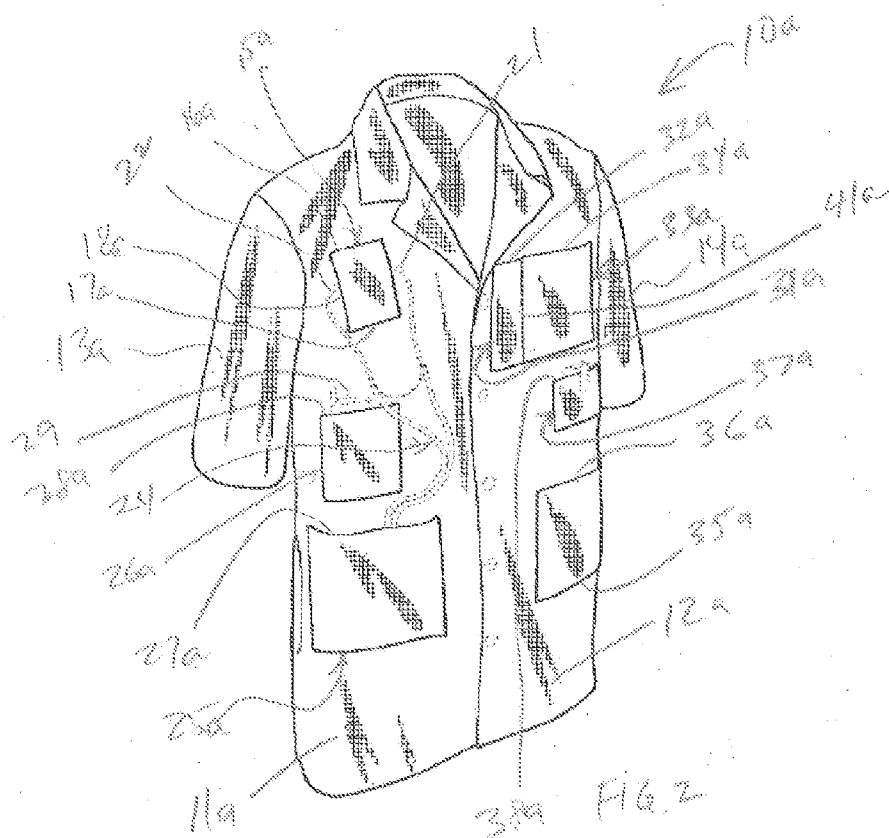
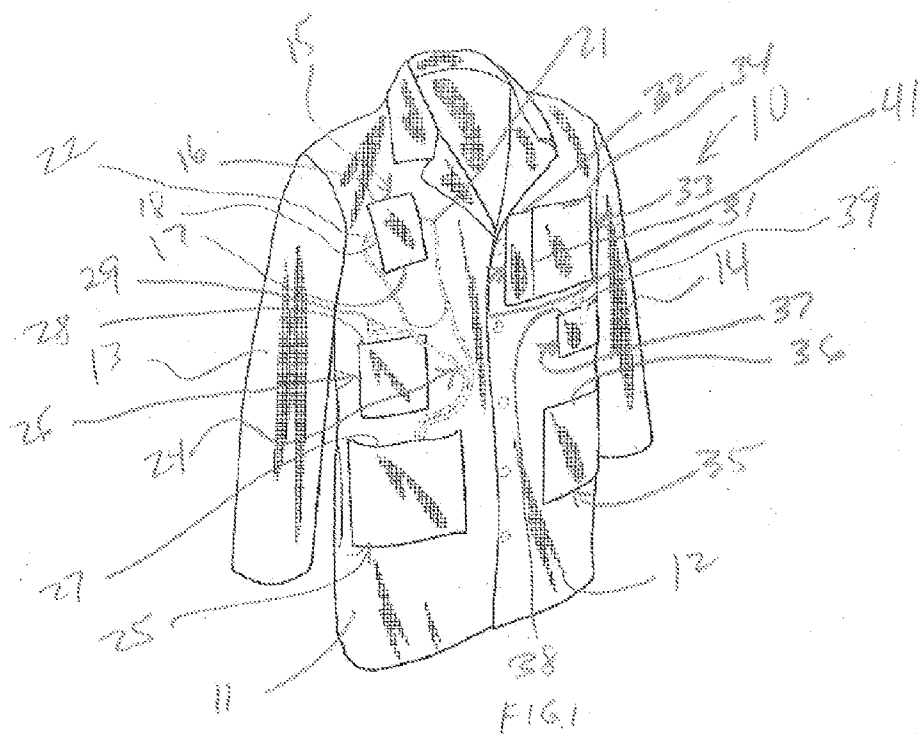
(19) **United States**(12) **Patent Application Publication**
Kinder et al.(10) **Pub. No.: US 2012/0030851 A1**(43) **Pub. Date: Feb. 9, 2012**(54) **ANTI-MICROBIAL MEDICAL GARMENTS****Publication Classification**(75) Inventors: **Charles Anthony Kinder**, Chicago, IL (US); **Gerald R. Levy**, Deerfield, IL (US)(51) **Int. Cl.**
A41D 13/00 (2006.01)(52) **U.S. Cl.** 2/69(73) Assignee: **DocFroc LLC**, Chicago, IL (US)(57) **ABSTRACT**(21) Appl. No.: **13/170,328**(22) Filed: **Jun. 28, 2011**

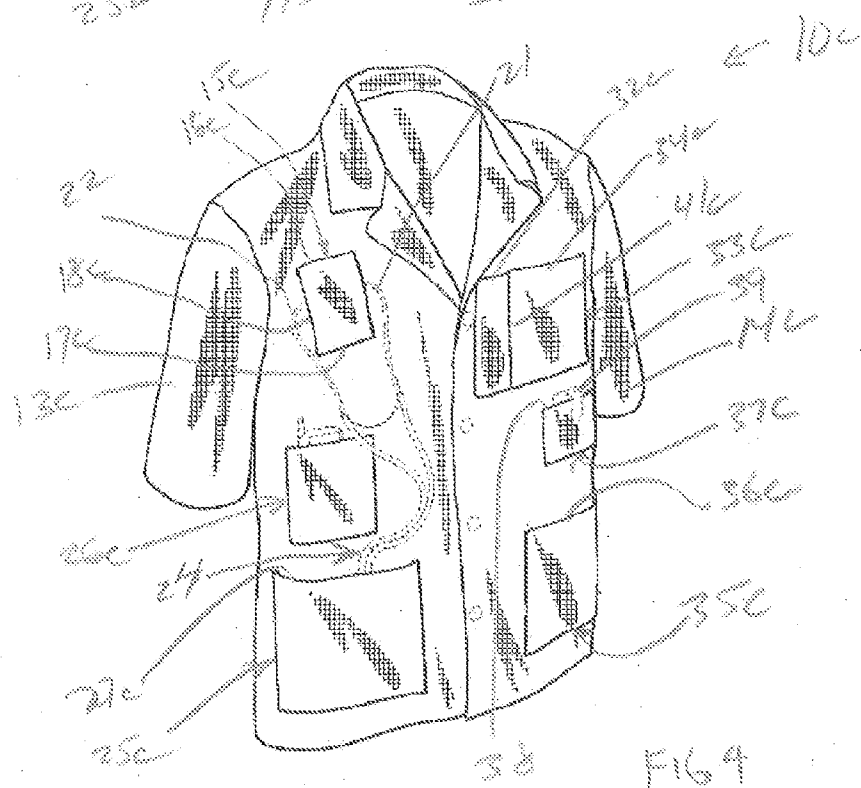
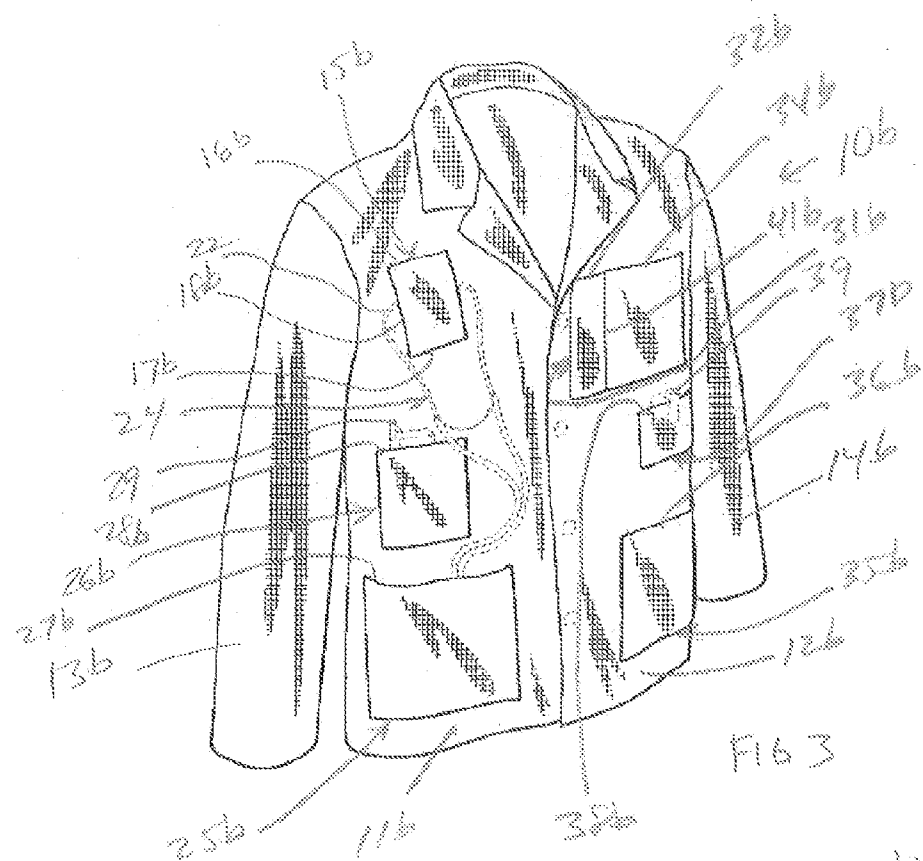
Improved medical garments are disclosed which are fabricated from woven or warp knit fabrics impregnated with an anti-microbial agent, such as silver in the form of a silver chloride solution during processing, and a hydrophobic agent, such as a fluorocarbon polymer and optional cross-linking agent. The garments are provided in various forms of medical lab coats for doctors and non-doctors and for both males and females. The combination of the anti-microbial agent and the hydrophobic agent provides improved kill rates for bacteria such as MRSA.

Related U.S. Application Data

(60) Provisional application No. 61/370,585, filed on Aug. 4, 2010.







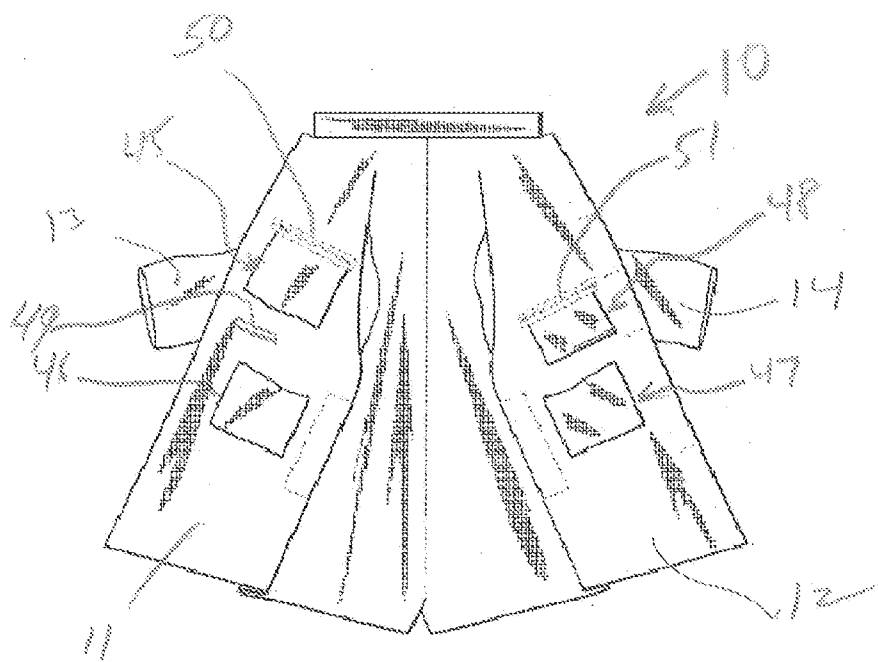


FIG 5

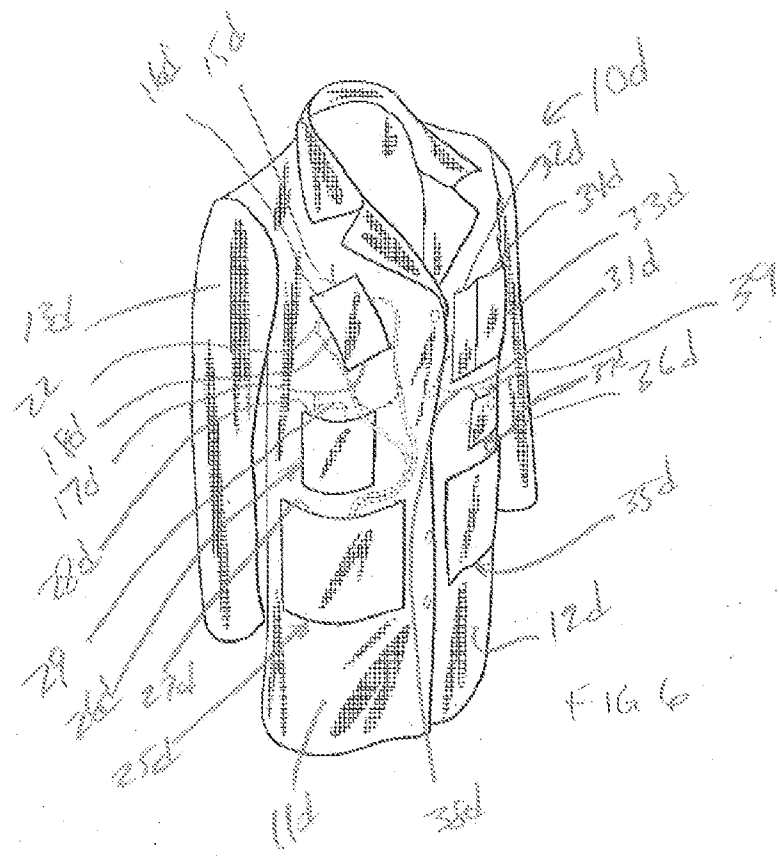


FIG 6

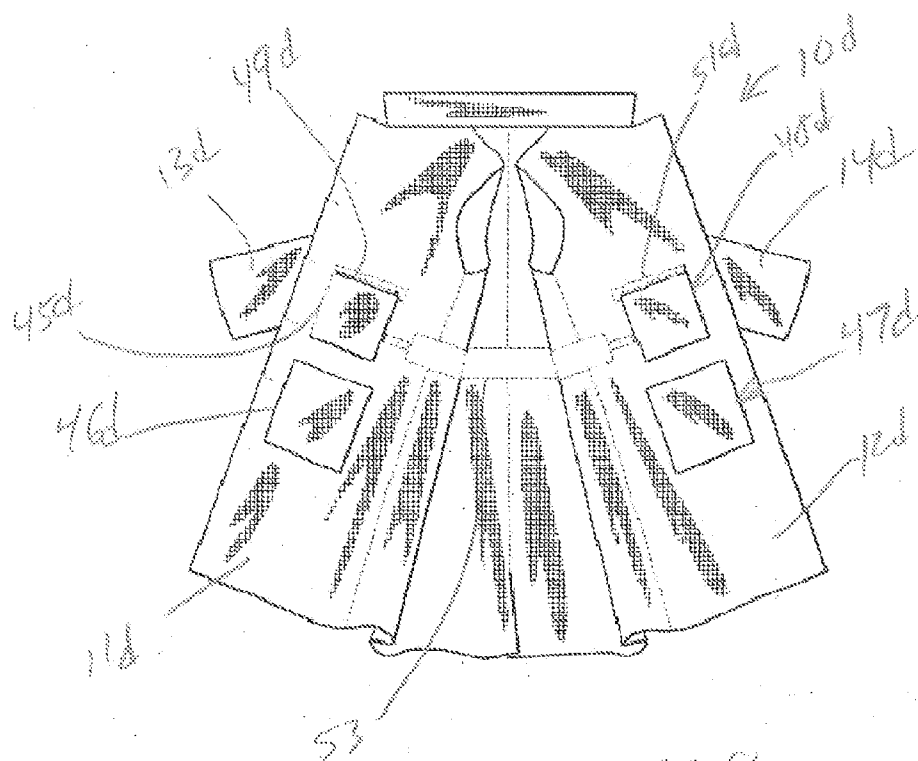
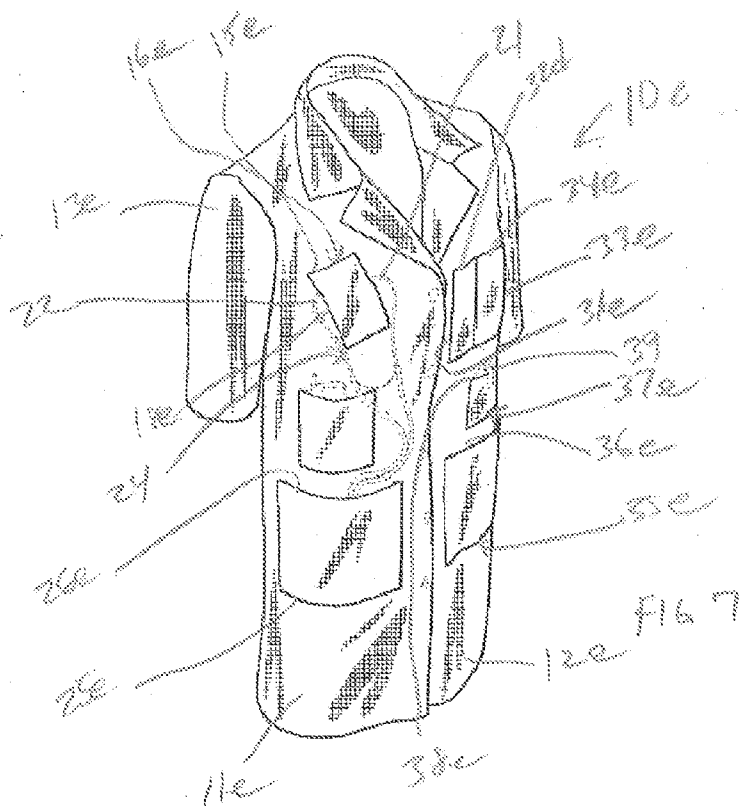


FIG 8

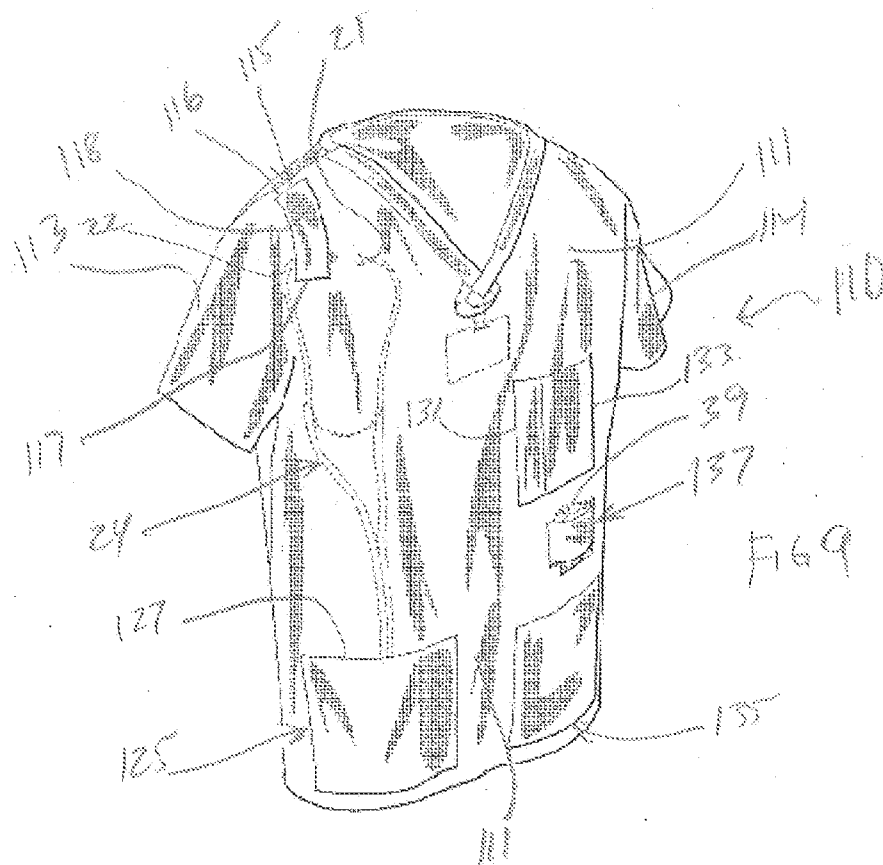


FIG 9

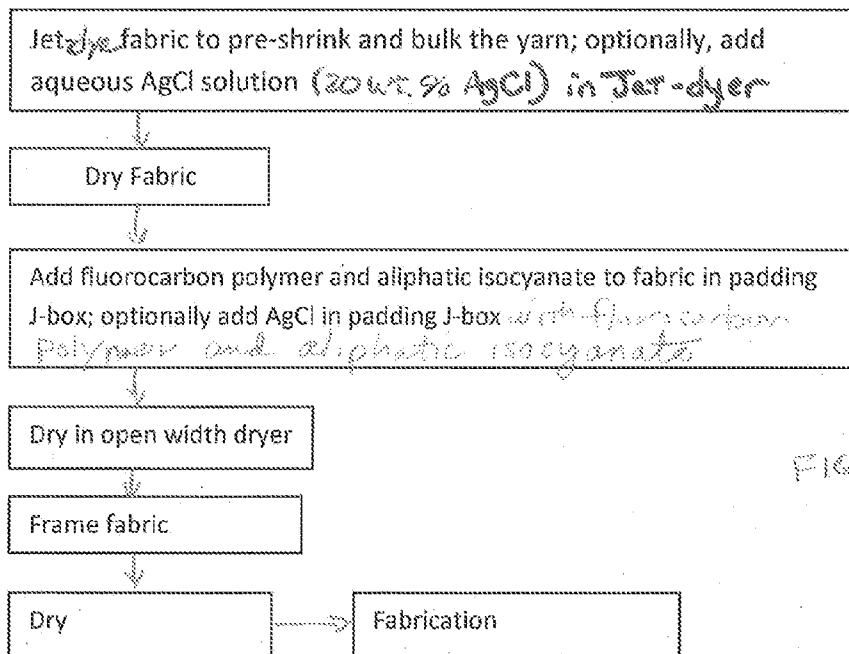


FIG 10

ANTI-MICROBIAL MEDICAL GARMENTS

BACKGROUND

[0001] 1. Technical Field

[0002] Improved medical garments such as lab coats and surgical scrubs are disclosed that include antibacterial and/or antimicrobial properties for reducing the migration of bacteria and microbes in medical environments such as hospitals, doctor offices, etc.

[0003] 2. Description of the Related Art

[0004] In recent years, the prevalence of nosocomial infections has caused serious implications for both patients and healthcare workers. Nosocomial infections are those that originate or occur in a hospital or long-term care, hospital-like settings. In general nosocomial infections are more serious and dangerous than external, community-acquired infections because the pathogens in hospitals are more virulent and resistant to typical antibiotics. According to the Centers for Disease Control (CDC), nosocomial infections are responsible for about 100,000 deaths in the United States per year. About 5% to 10% of American hospital patients (about 2 million per year) develop a clinically significant nosocomial infection. These hospital-acquired infections (HAIs) are usually related to a procedure or treatment used to diagnose or treat the patient's illness or injury. The average cost to treat these serious, but avoidable, infections is about \$30,000. Further, because many of these infections are avoidable, insurance companies and government agencies are becoming reluctant to pay for such treatments which could adversely affect the financial condition of many hospitals and/or patients.

[0005] One cause of the spread of infections in hospitals and medical facilities is the common lab coat and other garments such as surgical "scrubs" worn by doctors and medical personnel. Over the course of a shift when a medical worker treats numerous patients with a variety of ailments, these garments can become contaminated with various bacteria, viruses, etc. and therefore become carriers of infection. It has been shown that many viruses and bacteria can survive on an article of clothing for up to six hours. Superbugs such as staphylococcus can live on a polyester lab coat for up to 56 days. If the garments are not changed repeatedly throughout the shift, patients can be accidentally exposed to such bacteria and viruses. One specific problem is the exposure of vulnerable patients to methicillin-resistant *Staphylococcus aureus* (MRSA) as a result of contact with hospital staff and doctors.

[0006] For example, when doctors or nurses lean over the beds of patients who are carrying organisms, their clothing can become contaminated with bacteria or a virus. Throughout the worker's shift, the bacteria or viruses can be alive and passed on to other patients through incidental contact. While hospitals continue to make process and procedural improvements in an effort to reduce the number of incidents resulting from bacterial cross-contamination from contaminated catheters and other equipment, the issue of bacteria and viruses on clothing has largely been ignored.

[0007] The American Medical Association studied a proposal made at its annual meeting in June of 2009 that doctors stop wearing lab coats altogether. This approach has at least two problems. First, doctors and medical personnel need to wear some type of clothing, so substituting a lab coat or nurses' uniform for another garment, such as a dress shirt, won't solve the problem of clothing carrying bacteria and viruses. Second, the lab coat is part of what identifies a doctor

from other hospital personnel, such as interns and medical students. Patients share intimacies with doctors and doctors examine patients in a very intimate manner. As a result, doctors feel that they need to look the part or, in other words, wear the traditional garment—the white lab coat, while working with patients.

[0008] Another garment worn by doctors, nurses and other hospital personnel are surgical "scrubs." Similar to the lab coats discussed above, dirty scrubs can also spread bacteria and viruses to patients in the hospital. Further, it has been shown that hospital superbugs can escape into public places such as restaurants if hospital workers don't change or remove their scrubs or lab coats before leaving the hospital. As result, some hospitals now prohibit wearing scrubs outside the building, partly in response to the rapid increase in an infection called clostridium difficile or "C. diff". A national hospital survey released in November of 2008 warns that clostridium difficile (C. diff) infections are sickening nearly half a million people a year in the U.S., more than six times previous estimates.

[0009] Exacerbating these problems is that some medical personnel wear the same unlaundered scrubs, lab coats or uniforms to work day after day. Therefore, they can start their shift already carrying germs such as C.diff, MRSA or drug-resistant enterococcus or staphylococcus ("staph"). Doctors' lab coats may be the dirtiest. At the University of Maryland, 65% of medical personnel confess they change their lab coat less than once a week, even though they know it's contaminated. Fifteen percent admit they change their lab coat less than once a month.

[0010] One effort at making antimicrobial textiles is underway in Europe where the University of Limerick announced the development of textiles which will kill the MRSA using nanomaterials on textiles used in hospital drapes, bed linens and upholstery. Certain nanomaterials, which are a thousand times smaller than a human hair, are known to possess properties that kill MRSA. However, this technology has not been developed to the extent where it can be applied to clothing that needs to be laundered daily, such as lab coats and scrubs.

[0011] Yet another problem with the current lab coats worn by doctors is the overall design and placement of the pockets. The pockets are not sized or tailored to fit the tools doctors currently use, such as a stethoscope, mobile phone, pager, etc. Specifically, there is no way to anchor a stethoscope to a lab coat, so doctors tend to drape them over their neck, which leaves them vulnerable to falling off and onto a germ-laden floor. Further, if a lab coat is dropped or falls to the floor, the contents such as the pager and mobile phone are known to fall out of the pockets and onto the germ-laden floor. Also, for doctors who wear, neck ties, the tie can fall out of the coat and engage the patient or bed, thereby collecting germs in the process. Studies have shown that neck ties worn by doctors are often germ-laden, and cleaned infrequently. Therefore, the design of the current lab coat contributes to the spread of germs to stethoscopes, mobile phones, pagers, etc.

[0012] Therefore, there is a need for improved lab coats and surgical scrubs that addresses these concerns.

SUMMARY OF THE DISCLOSURE

[0013] To address the problems discussed above, a medical garment is disclosed that comprises a woven or warp knit fabric impregnated with an anti-microbial agent and a hydrophobic agent.

[0014] In a refinement, the anti-microbial agent comprises silver. In a further refinement, the anti-microbial agent comprises silver chloride.

[0015] In another refinement, the anti-microbial agent comprises a silver chloride solution, wherein water is removed from the garment during manufacturing.

[0016] In another refinement, the hydrophobic agent comprises a fluorocarbon polymer. In a further refinement, the hydrophobic agent comprises a mixture of a fluorocarbon polymer and a cross-linking agent. In still a further refinement, the cross-linking agent is an aliphatic isocyanate.

[0017] In another refinement, the hydrophobic agent comprises a mixture of a fluorocarbon polymer and a polyisocyanate selected from the group consisting of blocked di-polyisocyanate, unblocked di-polyisocyanate, blocked tri-polyisocyanate, unblocked di-polyisocyanate and combinations thereof.

[0018] In an embodiment, the woven or warp knit fabric comprises yarns comprising polyester and cotton wherein the polyester is present in an amount ranging from about 40% to about 90% and the cotton is present in an amount ranging from about 10% to about 60%.

[0019] In another refinement, the woven or warp knit fabric comprises yarns comprising polyester having a denier value ranging from about 50 to about 90.

[0020] In another refinement, the fabric comprises yarns consisting essentially of polyester, the anti-microbial agent comprises silver chloride and the hydrophobic agent comprises a fluorocarbon polymer and an aliphatic isocyanate cross-linker.

[0021] A method of fabricating a medical garment is also disclosed. The method comprises: providing a fabric; jet-dyeing the fabric while optionally applying an anti-microbial agent to the fabric; passing the fabric through a J-box while applying a hydrophobic agent, a cross-linking agent and an anti-microbial agent if not applied during the jet-dyeing; drying the fabric; and framing the fabric.

[0022] In a refinement, the drying of the fabric after the application of the hydrophobic agent and the cross-linking agent is carried out at a temperature ranging from about 290° F. (143° C.) to about 300° F. (149° C.).

[0023] An improved medical garment is disclosed which comprises at least a front panel sewed to a back panel. The front panel is connected to a strip comprising opposing ends. Each opposing end is connected to the front panel with a middle section disposed therebetween that is detached from the front panel for receiving at least one earpiece of a stethoscope. The medical garment further comprises a first pocket connected to the front panel with an open top end and disposed vertically below the strip for receiving a sensor end of the stethoscope when at least one earpiece is received between the strip and the front panel. The medical garment also comprises a second pocket connected to the front panel with an open top end for frictionally receiving a pager.

[0024] In a refinement, the medical garment further comprises a third pocket connected to the front panel with an open top end for frictionally receiving a mobile phone. In another refinement, the medical garment further comprises a fourth pocket connected to the front panel with an open top end for frictionally receiving at least one writing instrument. Similarly, the medical garment may comprise a fifth pocket connected to the front panel with an open top end for receiving personal effects.

[0025] In another refinement, the medical garment is a lab coat and the interior of the lab coat includes at least one pocket and a strip or loop for holding a necktie within the coat.

[0026] In another refinement, the interiors of the disclosed lab coats include one or more interior pockets, some of which may be closable, e.g. button, zipper, etc.

[0027] In another refinement, the medical garment may comprise sleeves connected to the front and rear panels and a fabric used to fabricate the front and rear panels and the sleeves. The fabric is impregnated with an anti-microbial agent and a hydrophobic agent.

[0028] In a further refinement, the hydrophobic agent is a combination of RUCO-GUARD UCS® and RUCO-GUARD XCR®, the anti-microbial agent is silver chloride.

[0029] Other advantages and features will be apparent from the following detailed description when read in conjunction with the attached drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

[0030] For a more complete understanding of the disclosed methods and garments, reference should be made to the embodiments illustrated in greater detail in the accompanying drawings, wherein:

[0031] FIG. 1 is a perspective view of a disclosed medical lab coat, designed for males;

[0032] FIG. 2 is another disclosed medical lab coat for males with short sleeves;

[0033] FIG. 3 is a disclosed medical lab coat for non-doctors such as interns and medical students;

[0034] FIG. 4 is another disclosed medical lab coat for non-doctors such as interns and medical students;

[0035] FIG. 5 is a plan view of the interior of the lab coat shown in FIG. 1, particularly illustrating four interior pockets and loop for securing a neck tie;

[0036] FIG. 6 is a perspective view of a disclosed medical lab coat, designed for females;

[0037] FIG. 7 is another disclosed medical lab coat designed for females, with short sleeves;

[0038] FIG. 8 is a plan view of the interior of the medical lab coat illustrated in FIG. 6, particularly illustrating four interior pockets and an elastic waist band;

[0039] FIG. 9 is a perspective view of a disclosed surgical scrub top; and

[0040] FIG. 10 is a flow chart that schematically illustrates the fabricating process for the medical garments disclosed herein.

[0041] It should be understood that the drawings are not necessarily to scale and that the disclosed embodiments are sometimes illustrated diagrammatically and in partial views. In certain instances, details which are not necessary for an understanding of the disclosed methods and garments or which render other details difficult to perceive may have been omitted. It should be understood, of course, that this disclosure is not limited to the particular embodiments illustrated herein.

DETAILED DESCRIPTION OF THE PRESENTLY PREFERRED EMBODIMENTS

[0042] Fabrics for the disclosed lab coats and surgical scrubs are polyester/cotton blends for comfort and durability. One preferred blend is 65% polyester and 35% cotton,

although the blends may range from a polyester:cotton ratio of about 35:65 to 100:0. The fabrics may be woven or warp knit.

[0043] One suitable construction for lab coats is poplin. Poplin, also called tabinet (or tabbinet), is a strong fabric in a plain weave, with cross-ribs that typically gives a corded surface. If the ribs are spaced far apart the fabric might look and act like rip-stop, and if the cross-ribs are spaced close together, it might look like canvas. Poplin is most often associated with dress shirts and the like. The disclosed lab coats and scrubs made from this construction are easy to iron and do not wrinkle easily.

[0044] In one example suitable for lab coats, the individual yarns are a polyester/cotton intimate blend, meaning that each yarn or thread includes both polyester and cotton. The polyester content can vary from 40% to 90%, with one preferred polyester content being about the 65%. The cotton content may range for about 10% to about 60%, with one preferred cotton content being about 35%. The fabric for the lab coat should not be too heavy and may range from 4 to 7 ounces per square yard, with one preferred fabric being about 5½ ounces per square yard. Again, poplin construction is preferred. Before shrinkage, the greige (or raw fabric) may be about 68 or 69 inches wide and, after finishing, the fabric is about 60 or 61 inches wide.

[0045] One suitable construction for surgical scrubs is twill. Twill is a type of textile weave with a pattern of diagonal parallel ribs. This is done by passing the weft thread over one or more warp threads and then under two or more warp threads and so on, with a “step” or offset between rows to create the characteristic diagonal pattern. Because of this structure, twills generally drape well. In a twill weave, each weft or filling yarn floats across the warp yarns in a progression of interlacings to the right or left, forming a distinct diagonal line. This diagonal line is also known as a wale. A float is the portion of a yarn that crosses over two or more yarns from the opposite direction.

[0046] In an example suitable for scrubs, the individual yarns are also a polyester/cotton intimate blend, meaning that each yarn or thread includes both polyester and cotton. The polyester content can vary from 40% to 90%, with one preferred polyester content being about the 65%. The cotton content may range for about 10% to about 60%, with one preferred cotton content being about 35%. The fabric for the scrubs should not be too heavy and may range from 3 to 6 ounces per square yard, with one preferred fabric being about 4½ ounces per square yard. Again, twill construction is preferred. Before shrinkage, the greige may be about 69 inches wide and, after finishing, about 60 or 61 inches wide.

[0047] In another example suitable for scrubs, the individual yarns are 100% 70 denier (i.e., 70 g/9000 meters of fiber) textured polyester, although the denier value may range from about 50 to about 90. This fabric should not be too heavy and may range from 3 to 6 ounces per square yard, with one preferred embodiment being about 4½ ounces per square yard.

[0048] Twill construction is preferred. Before shrinkage, the greige may be about 84 inches wide and, after finishing, the fabric is about 60 or 61 inches wide.

[0049] For the woven textiles used to fabricate the lab coats and scrubs disclosed herein, hydrophobic properties may be produced through use of water- or solvent-based fluorocarbon (FC) polymers. For example, EP-A-0 325 918, which is incorporated by reference, describes preparations which consist of

polyurethanes modified with perfluoroaliphatic groups, and which provide good water and oil repellency on textile substrates with satisfactory wash durability. EP-A-314 944, also incorporated by reference, discloses FC polymers with polyethylene and modified polysiloxanes. WO 99/14422, also incorporated by reference, describes a water repellent treatment that includes FC compounds in combination with a blocked isocyanate extender, which is a reaction product of a polyisocyanate, a diol and an isocyanate-blocking agent. EP 429983 A2, also incorporated by reference, describes a composition based on a perfluoroalkyl-containing polymer and an extender based on a cationically modified polyurethane. Finally, US 2006/0151739, also incorporated by reference, discloses a water and oil repellent for textiles that includes prior art FC polymers as described in the references listed above, a polyisocyanate blocked by a protecting group and, in the case of aqueous preparations, an emulsifier. The FC-based preparations provide good water-repellent properties having high durability to washing. One suitable FC product for use on the fabrics used for the lab coats and scrubs disclosed herein is RUCO-GUARD UCS®, sold by Rudolf GmbH of Germany.

[0050] To increase the ability of the garment to withstand washing and dry cleaning, a suitable booster may be employed, preferably in the form of an aromatic isocyanate cross-linking agent that has a relatively low unblocking temperature and a much lower resistance to yellowing at higher curing temperatures and in subsequent exposure to UV-light, ozone and various nitrogen oxides. One suitable booster is RUCO-GUARD XCR®, sold by Rudolf GmbH of Germany, which may be classified as a blocked aliphatic isocyanate with a minimum application temperature of 140° C.

[0051] Turning to the drawings, a disclosed lab coat **10** is fabricated from the treated fabric disclosed above, which is preferably a polyester/cotton blend impregnated with silver chloride, a fluorocarbon polymer and an aliphatic isocyanate, which is used as a cross-linking agent to increase the durability of the fluorocarbon polymer. The lab coat **10** includes two front panels **11**, **12** connected to a rear panel (not shown) and two sleeves **13**, **14**. A strip **15** is connected to the front panel **11** and includes two ends **16**, **17** which are connected to the front panel **11** leaving a mid portion **18** detached from the front panel **11** thereby forming a pocket or a loop which can be used to hold the earpieces **21**, **22** of a stethoscope **24**. The sensor, i.e. the bell or the electronic diaphragm of the stethoscope **24** can be accommodated in the pocket **25** which is disposed vertically below the strip **15** as shown. The panel **11** also includes a cell phone **29** pocket **26**. Both pockets **25**, **26** include open tops **27**, **28** respectively.

[0052] The other front panel **12** includes another pocket **31** with an open top **32** for accommodating writing instruments and yet another pocket **33** with an open top **34** for accommodating personal effects. It will be noted that the pockets **31**, **33** could be considered a single pocket with a line of stitching **41** separating the pocket **31/33** into two compartments. The pocket **35** also includes an open top **36** for personal effects. Finally, the pocket **37** also includes an open top **38** for frictionally receiving a pager **39**. While the lab coat **10** technically includes two front panels **11**, **12** that are buttoned together, while buttoned, the two panels **11**, **12** can be considered to be a single front panel, similar to the single front panel **111** of the scrubs **110** illustrated in FIG. 8.

[0053] Returning to FIG. 2, the medical lab coat **10a** includes the same features as the lab coat **10** shown in FIG. 1,

but with short sleeves **13a**, **14a**. The remaining functional elements shown in FIG. 2 are essentially the same as those shown in FIG. 1 but are labeled with the suffix "a".

[0054] FIGS. 3 and 4 illustrate lab coats **10b**, **10c** designed for non-doctors such as medical students and interns due to their shorter lengths. Because the functional elements shown in FIGS. 3 and 4 are the same as those shown in FIGS. 1 and 2, such elements have been labeled with the same reference numerals followed by the suffixes "b" and "c" respectively.

[0055] Turning to FIG. 5, the interior of the lab coat **10** is illustrated which includes four pockets **45-48** and a loop **49** for holding a neck tie. The loop **49** may be constructed similar to the loop **15** for holding ear pieces **21**, **22** of the stethoscope **24**. Two of the pockets **45**, **48** include enclosures **50**, **51** respectively such as zippers, buttons, hook and loop fasteners, etc.

[0056] FIGS. 6-8 disclose medical lab coats **10d**, **10e**, designed for females. The coats include the same functional features as those shown in FIGS. 1-5 except for the addition of an elastic waist band **53** (FIG. 8) and differently tailored panels **11d**, **12d**.

[0057] Turning to FIG. 9, a surgical scrub top **110** is disclosed with short sleeves **113**, **114**. The scrub **110** includes a strip **115** with two opposite ends **116**, **117** that are attached to the front panel **111**. A middle portion **118** of the strip **115** is detached from the front panel **111** so it can receive at least one of the earpieces **21**, **22** of the stethoscope **24**. Similar to the lab coats **10-10e**, the scrub **110** includes a lower pocket **125** with an open top **127** for receiving the sensing end of the stethoscope **24**. An additional pocket **135** is provided for personal effects while the pocket **137** frictionally receives a pager **39**. Writing instruments or other cylinder instruments may be contained in the pocket **131** and larger articles may be contained in the pocket **133**.

[0058] One process for fabricating the scrubs **110** and lab coats **10-10e** is schematically illustrated in the flow chart of FIG. 10. First, the fabric, either the polyester/cotton intimate blend used for the lab coats **10-10e** or the polyester fabric used to fabricate the scrubs **110** is jet dyed which pre-shrinks the yarns of the woven fabrics and bulks the yarns. An anti-microbial solution, such as a silver chloride solution may be added to the jet dyer. Optionally, the anti-microbial agent may be added with the fluorocarbon polymer and aliphatic isocyanate cross-linking agent in the padding J-box. Between the jet dying and the J-box, the fabric is dried. After the fluorocarbon polymer and aliphatic isocyanate cross-linking agent is added in the padding J-box, the fabric is dried again, preferably in an open width dryer. The fabric is then framed and allowed to dry further before it is sent for cutting and fabrication or assembly into the lab coats **10-10e** and scrubs **110** shown in FIGS. 1-8. The dried fabric is treated in water after it is jet dyed. To treat the fabric, a 1 wt % concentration of AgCl is used along with 6 wt % UCS and 1.5 wt % XCR. The fabric is the re-dried as shown in FIG. 10 and framed.

[0059] Test Results:

[0060] 1"x1" fabric pieces were exposed to methicillin resistant *staphylococcus aureus*—MRSA (ATCC 33592). The presence of the MRSA was measured after 2, 4, 8, and 24 hours.

[0061] Each experiment was repeated twice. Triton-X™, a hydrophilic surfactant was added to ensure that the MRSA

adhered to the fabric. The fabric pieces were exposed to the MRSA at 35-37° C. and at 70-80% humidity.

EXAMPLE 1

Untreated Poplin Fabric—Geometric Mean

[0062] $T_0=5.89 \times 10^5$ CFU/carrier
[0063] 2 hour= 5.62×10^3 CFU/carrier
[0064] 4 hour= 7.08×10^3 CFU/carrier
[0065] 8 hour= 3.63×10^3 CFU/carrier
[0066] 24 hour= 1.82×10^3 CFU/carrier

EXAMPLE 2

Poplin Treated with Silver Agent—Geometric Mean

[0067] $T_0=5.62 \times 10^5$ CFU/carrier
[0068] 2 hour= 8.32×10^3 CFU/carrier (No reduction)
[0069] 4 hour= 4.47×10^3 CFU/carrier (36.9% reduction)
[0070] 8 hour= 1.62×10^3 CFU/carrier (55.4% reduction)
[0071] 24 hour= 6.61×10^2 CFU/carrier (63.7% reduction)

EXAMPLE 3

Poplin Treated with Silver and Hydrophobic Agents—Geometric Mean

[0072] $T_0=6.61 \times 10^5$ CFU/carrier
[0073] 2 hour= 5.13×10^3 CFU/carrier (8.7% reduction)
[0074] 4 hour= 1.95×10^3 CFU/carrier (72.5% reduction)
[0075] 8 hour= 6.92×10^2 CFU/carrier (80.9% reduction)
[0076] 24 hour= 1.38×10^2 CFU/carrier (92.4% reduction)
[0077] As shown above, the novel combination of an anti-microbial agent in the form of silver in combination with a hydrophobic agent in the form of a fluorocarbon polymer and aliphatic isocyanate cross-linker (Example 3) kills MRSA more effectively than silver alone (Example 2).

INDUSTRIAL APPLICABILITY

[0078] The disclosed lab coats **10-10e** and scrubs **110** include both an anti-microbial agent as well as a hydrophobic agent which helps preserve the anti-microbial agent during multiple washings. The hydrophobic agent also resists the accumulation of dirt stains during a shift so the lab coats **10-10e** and scrubs **110** look as clean as possible. As a result of the improved lab coats **10-10e** and scrubs **110**, less bacteria and fewer viruses will be transmitted from medical workers to patients and vice versa, thereby saving lives.

[0079] Further, doctors, interns and medical students will greatly appreciate the additional and more functional pockets and the more sanitary means for carrying the stethoscope **24**.

[0080] While only certain embodiments have been set forth, alternatives and modifications will be apparent from the above description to those skilled in the art. These and other alternatives are considered equivalents and within the spirit and scope of this disclosure and the appended claims.

1. A medical garment comprising:
 - a fabric impregnated with
 - an anti-microbial agent, and
 - a hydrophobic agent.
2. The medical garment of claim 1 wherein the anti-microbial agent comprises silver.
3. The medical garment of claim 1 wherein the anti-microbial agent comprises silver chloride.

4. The medical garment of claim 1 wherein the anti-microbial agent comprises a silver chloride solution, wherein water is removed from the garment during manufacturing.

5. The medical garment of claim 1 wherein the hydrophobic agent comprises a fluorocarbon polymer.

6. The medical garment of claim 1 wherein the hydrophobic agent comprises a mixture of a fluorocarbon polymer and a cross-linking agent.

7. The medical garment of claim 6 wherein the cross-linking agent is an aliphatic isocyanate.

8. The medical garment of claim 1 wherein the hydrophobic agent comprises a mixture of a fluorocarbon polymer and a polyisocyanate selected from the group consisting of blocked di-polyisocyanate, unblocked di-polyisocyanate, blocked tri-polyisocyanate, unblocked di-polyisocyanate and combinations thereof.

9. The medical garment of claim 1 wherein the fabric comprises yarns comprising polyester and cotton wherein the polyester is present in an amount ranging from about 40% to about 90% and the cotton is present in an amount ranging from about 10% to about 60%.

10. The medical garment of claim 1 wherein the fabric comprises yarns comprising polyester having a denier value ranging from about 50 to about 90.

11. The medical garment of claim 1 wherein the fabric or comprises yarns comprising polyester and cotton wherein the polyester is present in an amount ranging from about 40% to about 90% and the cotton is present in an amount ranging from about 10% to about 60%, the anti-microbial agent comprises silver chloride and the hydrophobic agent comprises a fluorocarbon polymer and an aliphatic isocyanate.

12. The medical garment of claim 1 wherein the fabric comprises yarns consisting essentially of polyester, the anti-microbial agent comprises silver chloride and the hydrophobic agent comprises a fluorocarbon polymer and an aliphatic isocyanate.

13. A method of fabricating a medical garment comprising:
providing a fabric;
jet-dyeing the fabric while applying an anti-microbial agent to the fabric;
drying the fabric;
passing the fabric through a J-box while applying a hydrophobic agent and a cross-linking agent;

drying the fabric; and
framing the fabric.

14. The method of claim 13 wherein the anti-microbial agent comprises a 20 wt % AgCl solution.

15. The method of claim 13 wherein the drying of the fabric after the application of the hydrophobic agent and cross-linking agent is carried out at a temperature ranging from about 290° to about 300° F.

16. A medical garment comprising:

a front, a back and a pair of sleeves,

the front being connected to a strip comprising opposing ends, each opposing end is connected to the front with a middle section disposed therebetween and detached from the front for receiving at least one earpiece of a stethoscope,

a first pocket connected to the front panel with an open top end and disposed vertically below the strip for receiving a sensor end of the stethoscope,

a second pocket connected to the front panel with an open top end for frictionally receiving a pager.

17. The medical garment of claim 15 further comprising a third pocket connected to the front panel with an open top end for frictionally receiving a mobile phone.

18. The medical garment of claim 16 further comprising a fourth pocket connected to the front panel with an open top end for frictionally receiving at least one writing instrument.

19. The medical garment of claim 17 further comprising a loop connected to an interior of the front panel end for receiving an end of a neck tie.

20. The medical garment of claim 18 further comprising sleeves connected to the front and rear panels and a fabric used to fabricate the front and rear panels and the sleeves and wherein the fabric is impregnated with an anti-microbial agent and a hydrophobic agent.

21. The medical garment of claim 19 wherein the hydrophobic agent is a combination of RUCO-GUARD UCS® and RUCO-GUARD XCR®, and the anti-microbial agent is silver chloride.

22. The medical garment of claim 20 further comprising a plurality of interior pockets, at least one of which includes a fastener.

* * * * *