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(54) **GARMENT WITH WIPE ZONES**

(57) A lower-body garment is disclosed. The lower body garment includes a torso portion adapted to cover at least a lower torso area of a wearer when the lower-body garment is worn by the wearer. Further, the lower body garment includes a first leg portion extending from the torso portion and a second leg portion extending from the torso portion, wherein the torso portion defining at least a waist opening, and wherein the first leg portion and the second leg portion defining a first leg opening and a second leg opening respectively. Further, the lower-body garment includes at least one wipe zone comprising a repeating linear pattern of foam ink deposited at one or more predetermined locations on the lower-body garment.

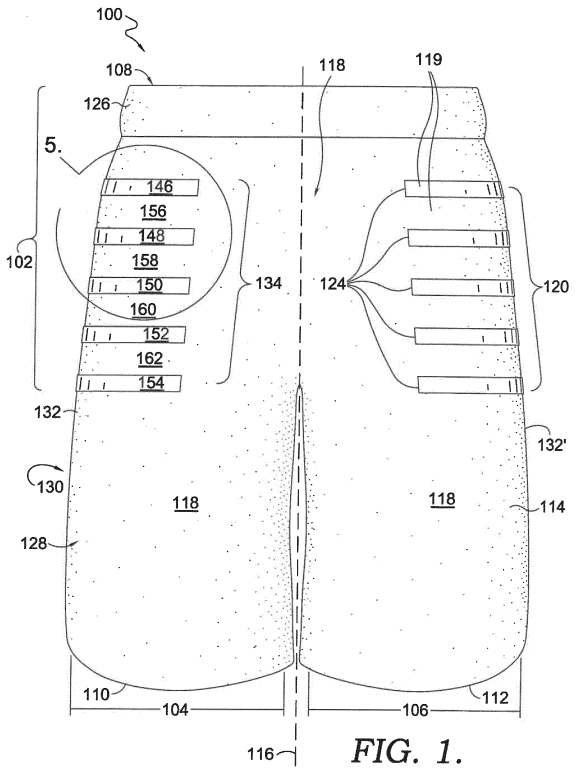

FIG. 1.

EP 3 977 879 A1

Description

FIELD OF THE INVENTION

[0001] The present disclosure relates to garments having wipe zone structures that provide a mechanism for transferring away moisture and/or particulate matter from, for example, a wearer's hands when drawn across the wipe zone structures.

BACKGROUND OF THE INVENTION

[0002] It is often desirable to use one's own garment to wipe away moisture and/or particulate matter that may accumulate during physical activity. However, garments worn during physical activities are not often designed to effectively remove moisture and/or particulate matter from one's hands during physical activity.

BRIEF DESCRIPTION OF THE DRAWING

[0003] Examples of the present invention are described in detail below with reference to the attached figures, wherein:

FIG. 1 depicts a front view of an exemplary lower-body garment comprising wipe zone structures, in accordance with aspects herein;
FIG. 2 depicts a side view of an exemplary lower-body garment comprising wipe zone structures, in accordance with aspects herein;
FIG. 3 depicts a rear view of an exemplary lower-body garment comprising wipe zone structures, in accordance with aspects herein;
FIG. 4 depicts a front view of an exemplary upper-body garment comprising wipe zone structures, in accordance with aspects herein;
FIG. 5 depicts an exemplary wipe zone structure configuration of the wipe zone structures depicted in the lower-body garment of FIG. 1, in accordance with aspects herein;
FIG. 6 depicts an exemplary wipe zone structure configuration of the wipe zone structures depicted in the lower-body garment of FIG. 2, in accordance with aspects herein;
FIG. 7 depicts an alternate exemplary wipe zone structure configuration, in accordance with aspects herein;
FIG. 8 depicts a cross-sectional view of an exemplary wipe zone structure, in accordance with aspects herein;
FIGS. 9A-9C depict various exemplary geometries of wipe zone structures, in accordance with aspects herein;
FIG. 10 depicts an athlete using exemplary wipe zone structures located on the back aspect of an exemplary lower-body garment to mechanically remove moisture and/or particulate matter from the individual's hands, in accordance with aspects herein;
FIG. 11 depicts an athlete using exemplary wipe zone structures located on the front aspect of an exemplary lower-body garment to mechanically remove moisture and/or particulate matter from the individual's hands, in accordance with aspects herein; and
FIG. 12 depicts a flow diagram illustrating an exemplary method for manufacturing an exemplary garment having wipe zone structures, in accordance with aspects herein.

DETAILED DESCRIPTION OF THE INVENTION

[0004] The subject matter of aspects provided herein is described with specificity to meet statutory requirements. However, the description itself is not intended to limit the scope of this disclosure. Rather, the inventors have contemplated that the disclosed or claimed subject matter might also be embodied in other ways, to include different steps or combinations of steps similar to the ones described in this document, in conjunction with other present or future technologies. Moreover, although the terms "step" and/or "block" might be used herein to connote different elements of methods employed, the terms should not be interpreted as implying any particular order among or between various steps herein disclosed unless and except when the order of individual steps is explicitly stated.

[0005] During exercise, athletes often have a need or a desire to wipe away moisture and/or other particulate matter. For example, an individual playing basketball may accumulate particulate matter such as dirt on their hands from the basketball and floor surface, in addition to accumulating moisture from physical activity. The accumulation of moisture and/or particulate matter in such instances may prevent an individual from maintaining proper hand grip on equipment or may get into the athlete's eyes, disturbing them while active. This may not only disturb the individual, but could potentially result in risk of injury depending on the type of activity that an individual is participating in. To resolve this issue, oftentimes, a person who is engaged in a physically demanding activity will carry a towel to wipe away moisture and/or particulate matter. However, having to carry a towel around is often cumbersome, and once the towel becomes saturated, the towel is ineffective for its intended purpose. Accordingly, the most convenient tool for wiping away the moisture and/or particulate matter often ends up being the individual's own garments.

[0006] However, garments traditionally worn for physical activities are not necessarily configured to facilitate the wiping away of large amounts of moisture and/or particulate matter. For example, garments made from hydrophilic materials retain or absorb the moisture, which causes the garment itself to eventually become saturated with moisture or other fluids, rendering the garment ineffective in wiping away moisture and/or particulate matter,

similar to the towel. Other garments used for physical activities are made from materials with low absorptive abilities, which may limit the amount of moisture and/or particulate matter that can be wiped away. Accordingly, aspects herein contemplate the application of a surface treatment onto garments in one or more predetermined locations to provide strategically placed wipe zone structures that are easily accessible to the wearer for wiping away moisture and/or particulate matter. The wipe zone structures are configured to have 1) a raised surface formed from the application of a surface treatment in predetermined locations and in repeating patterns, and 2) an ability to facilitate the mechanical removal of moisture and/or particulate matter collected on the surface of the wearer's skin onto the wipe zone structures.

[0007] At a high level, aspects herein are directed to garments comprising wipe zone structures. The wipe zone structures in the garments may comprise a plurality of raised structures comprising a surface treatment that has been applied in a repeating pattern and extends outward from the surface plane of the garment. The wipe zone structures provide a surface that may have a higher coefficient of friction than, for example, other areas of the garment that do not have the wipe zone structures. Further, the wipe zone structures provide more surface area to the otherwise substantially planar surface of the garment, to effectively wipe away moisture and/or particulate matter from an individual's skin when the skin is rubbed against or otherwise moved across the wipe zone structures.

[0008] In accordance with aspects herein, surfaces that are "substantially planar" may be defined as surfaces having components or structures that have a height that is 20% or less of the height of the wipe zone structures, where the height is measured perpendicularly from the plane of the fabric surface. As used throughout this disclosure, the term "zone" is used to refer to distinct areas within the garment. And, as used throughout this disclosure, the term "wipe zone structure" refers to a "zone" having a surface treatment applied in a repeating pattern creating raised structures capable of wiping moisture and/or particulate matter away from an individual's skin surface. Further, as used throughout this disclosure, the term "first zone" is used to refer to distinct areas within the garment where there are no wipe zone structures, while the term "second zone" is used to refer to distinct areas within the garment where the wipe zone structures are located. Finally, as used throughout this disclosure, the term "moisture" is used to refer to moisture, water, sweat, or other liquid that may be in a condensed or diffused form and accumulate on an individual's body during physical activity.

[0009] The wipe zone structures described herein are created through the application of a surface treatment to an outer surface of an apparel item. The wipe zone structures may have raised surfaces of varying height, width, and shape that allow for mechanical removal of moisture and/or particulate matter from, for example, an athlete's hands. For example, a football player may accumulate moisture and/or particulate matter on their hands from the football or falling to the ground during a game, and may use the wipe zone structures found on the apparel item to wipe his or her hands over the raised surfaces of the wipe zone structures to mechanically remove the moisture and/or particulate matter. As will be explained further below, the location of the wipe zone structures are selected based on where athletes or wearers typically contact their hands during physical activity. As such, they are designed to be an effective and convenient way for an individual to remove moisture and/or particulate matter from their hands.

[0010] The wipe zone structures may be used in various garments, including upper-body garments and lower-body garments, and may be strategically positioned in areas naturally used by wearers for wiping away moisture and/or particulate matter. An exemplary finalized garment construct, in one aspect, may comprise a lower body garment. For example, the lower body garment may comprise a pair of shorts such as basketball shorts. Basketball athletes, for example, due to their constant high paced motion, tend to sweat from the palms of their hands and accumulate moisture on their hands. Having wet or damp hands while participating in a game would be undesirable because it would potentially lower the athletes' performances by making their palms slippery and unable to get a good grip on the ball, such as when the ball is passed to them. Typically, athletes will attempt to dry the palms of their hands by wiping them on their shorts or jerseys. However, oftentimes, the athletes' shorts or jerseys will not be very effective in removing sweat or moisture from the athletes' palms because these garments conventionally have smooth and slippery surfaces. Additionally, after one or two wiping motions, and as physical exertion increases over time, these garments may themselves become saturated with sweat or other fluids, making them ineffective for removing sweat from the athletes' palms.

[0011] Further, a basketball athlete's hands may come in regular contact with the ball and floor, which may result in the accumulation of particulate matter on the athlete's hands. Such accumulation of particulate matter may lead to difficulty with maintaining a strong grip on the basketball and decreased accuracy or success in the player's game. Shorts or jerseys may not be effective in removing such particulate matter as they generally include substantially planar surfaces with no raised surface to create friction for the removal of particulate matter or moisture. Basketball shorts are just one example of the finalized garment construct contemplated herein. Other exemplary garment constructs comprise, for instance, garments for tennis players, football players, softball or baseball players, and the like.

[0012] In some aspects, the wipe zone structures are on a pair of shorts and may be positioned on an outer-facing surface on the front aspect of the first and second leg portions of the shorts or may be positioned on the

outer-facing surface on the rear aspect of the torso portion of the shorts and/or the rear aspect of the first and second leg portions of the shorts. In other aspects, wipe zone structures may be located on an upper-body garment, such as a t-shirt or a jersey. The wipe zone structures may be part of an outer-facing surface near a bottom portion of the front and sides of the sleeves of the upper-body garment. These locations take advantage of a wearer's tendency to remove moisture and/or particulate matter by drawing their forearm across their face and neck region to remove moisture and/or particulate matter. As well, the wipe zone structures may be located on an outer-facing surface of the garment near a bottom portion of the front torso portion of the upper-garment (e.g., near the bottom hem). This location takes advantage of a wearer's tendency to lift the bottom of their shirt and draw it across their face and neck.

[0013] Accordingly, aspects of the disclosure include a garment comprising a first zone and a second zone adjacent the first zone on the outer-facing surface of the garment. The first and second zones may comprise the same textile material. The second zone further comprises an elastomeric polymer that has been deposited in a repeating array or pattern at one or more predetermined locations and results in the formation of the wipe zone structures. For example, in a lower-body garment, such as a pair of athletic shorts, the elastomeric polymer may be deposited onto the front aspects of the lower-body garment on the outer-facing surface of first and second leg portions of the shorts and on the torso portion as seen in FIG. 1. In exemplary aspects, the raised structures may be formed through the application of at least one layer of the elastomeric polymer in a repeating array to at least one portion of the garment. In an exemplary aspect, the repeating array comprises a plurality of separate and distinct lines of elastomeric polymer, each line of elastomeric polymer being separated from an adjacent line of elastomeric polymer by an intervening space. Because the raised structures formed by the deposition of the elastomeric polymer help to further increase the surface area of a wipe zone structure and/or help to increase the coefficient of friction of the wipe zone structure as compared to other portions of the garment, the raised structures may increase the wipe zone structure's ability to transfer moisture and/or particulate matter away from the wearer's skin and may be arranged in any pattern to provide a desired removal effect while also being aesthetically appealing.

[0014] The elastomeric polymer deposited in the repeating array may further comprise multiple layers, wherein the first layer has a width that is greater than the second layer of elastomeric polymer, and so on and may be deposited on the garment through, for instance, a multi-layer screen printing process. Each layer may be partially activated or cured (the terms "activated" and "cured" may be used interchangeably herein) before the addition of the new layer. The elastomeric polymer may be deposited on an apparel item utilizing, for instance, screen printing (using, for instance, a regular screen or a high-density screen), two-dimensional (2-D) printing, 3-D printing, manual application, and the like. Further, each line of elastomeric polymer applied may have a predetermined height between 4-6 millimeters, allowing for easy transfer of moisture and/or particulate matter from a wearer's skin surface to the wipe zone structure when the wearer's skin surface comes in contact with the elastomeric polymer. The wearer can easily bend down or reach their arms down to the wipe zone structures located in the second zone and rub the skin surface of their hands against the wipe zone structures to allow for transfer of moisture and/or particulate matter from the wearer's skin surface to the wipe zone structure. Additionally, the location of the wipe zone structure and the raised texture of the elastomeric polymer allows for a wearer to remove the moisture and/or particulate matter while remaining in motion. As used throughout this disclosure, the term "elastomeric polymer" may be defined as polymer joined by chemical bonds, acquiring a final slightly crosslinked structure. Examples of elastomers that may be utilized, include, but are not limited to polyurethane, thermoplastic polyurethane, and silicone.

[0015] In another aspect, a lower-body garment comprises a torso portion adapted to cover at least a lower torso area of a wearer when the lower-body garment is worn by the wearer, a first leg portion extending from the torso portion, and a second leg portion extending from the torso portion. The torso portion, the first leg portion, and the second leg portion may define at least a waist opening, a first leg opening, and a second leg opening. The lower-body garment additionally comprises at least one wipe zone structure comprising a repeating pattern of printed foam ink that is deposited at one or more predetermined locations on the lower-body garment. The deposition of the foam ink in a repeating linear pattern similarly results in a raised surface which assists in the transfer of moisture and/or particulate matter from a wearer's skin surface to the wipe zone structure upon contact with the wearer's skin. As used throughout this disclosure, the term "linear pattern" may be defined as a continuous application of an elastomeric polymer and/or a foam ink in a generally straight line having a minimum length of at least 5 cm. Alternatively, it is contemplated that the continuous application of an elastomeric polymer and/or foam ink may occur in any nonlinear pattern, such as a curvilinear line, that is that is both suitable for its intended purpose and, at the same time, is aesthetically appealing.

[0016] As used throughout this disclosure, the term "foam ink" or "printed foam ink" may be defined as a raised surface formed by incorporating a foaming additive into one or more ink formulations (water-based, silicone-based, polyurethane-based, rubber-based, acrylic-based, plastisol inks, and the like). The foaming additive/ink formulation may be applied or adhered to an apparel item utilizing, for instance, screen printing (using, for instance, a regular screen or a high-density screen),

two-dimensional (2-D) printing, 3-D printing, manual application, and the like. Upon exposure to an activator such as heat, light, radio-frequency waves, ultrasound, water, chemicals, and the like, the foaming additive expands to form cells or microspheres within the base ink. The result is that the ink formulation "rises" or extends away from the surface plane of the apparel item in all directions (e.g., in an x-direction, a y-direction, and a z-direction) by a predetermined amount which may be dependent upon the particular foaming additive/ink formulation used and/or may be dependent upon the variables associated with the activation process such as time, temperature, intensity, and the like.

[0017] Further, it is contemplated herein that the term "foam ink" or "printed foam ink" may encompass a single layer of the foaming additive/ink formulation or multiple layers of the foaming additive/ink formulation (2 layers, 3 layers, etc.). Each layer may be partially cured before the addition of the new layer. In exemplary aspects, the partial activation may help to at least partially set the ink (*e.g.*, causing the ink to assume a gel-like consistency) and to initiate the expansion of the foaming additive. The partial-curing step may comprise exposing the ink/foaming additive formulation to a predefined temperature for a predefined period of time. Different temperatures and/or different time periods may be used for each layer or the same temperature and time period may be used for each layer. Any and all aspects, and any variation thereof, are contemplated as being within the scope herein. Once all the layers have been applied, a final curing step may be done to fully set the ink and to complete the activation of the foaming additive. The final curing step may take place at a different temperature and time period than the partial curing steps (*e.g.*, at a higher temperature and for a longer period of time). In exemplary aspects, the partial-curing steps and the final curing step may be achieved using modalities such as infra-red light, ultrasound, radio-frequency waves, chemicals, water, ultraviolet lights, and the like. Any and all aspects, and any variation thereof, are contemplated as being within the scope herein.

[0018] Each of the layers may be applied in a different pattern or the same pattern as the preceding layer. Further, each of the layers may occupy a smaller surface area than the preceding layer such that the top layer occupies the smallest surface area compared to the other layers. The formation of the multi-layer surface treatment comprising foam ink may create wipe zone structures having a height between 2.0-2.5 millimeters, which allows for efficient transfer of moisture and/or particulate matter from a wearer's skin surface to the wipe zone structure.

[0019] It is contemplated herein that each layer of foam ink may comprise the same foaming additive/ink formulation, or different foaming additive/ink formulations may be used for one or more of the layers. It is further contemplated herein, that one or more of the layers may not comprise a foaming additive. For instance, it is contemplated herein that each layer may have the same thickness, or one or more of the layers may have a different thickness. Any and all aspects, and any variation thereof, are contemplated as being within the scope herein.

[0020] Continuing, in exemplary aspects, the ink formulation for a top layer of the foam ink applied may be selected to have a soft feel as this layer will come into contact with the wearer's skin when the wearer uses the wipe zone structure to wipe away moisture and/or particulate matter. For instance, a silicone-based ink formulation may be selected as these formulations generally have a soft feel and exhibit a degree of elasticity that allows them to stretch without cracking or breaking. Ink formulations that are considered to be hypoallergenic may also be selected to reduce the chances of skin irritation. Moreover, different finishes may be applied to the top layer to further increase the soft feel and/or comfort for when the wearer's skin contacts the wipe zone structure comprising the foam ink.

[0021] A further aspect of the present disclosure includes a method of manufacturing a lower-body garment comprising wipe zone structures. The method may comprise providing a lower-body garment comprising a torso portion, a first leg portion extending from the torso portion, a second leg portion extending from the torso portion, the torso portion defining at least a waist opening, the first leg portion and the second leg portion defining a first leg opening and a second leg opening respectively. Next, at least one layer of surface treatment is applied in a repeating pattern to at least one portion of an outer-facing surface of the front aspect, side aspect, or back aspect of the first and second leg portions to form the wipe zone structures. The surface treatment applied may be an elastomeric polymer or a foam ink or some combination thereof. Additionally, the surface treatment applied to the lower-body garment to create the wipe zone structures may be applied via a process that produces at least one raised surface for wiping away moisture and/or particulate matter from the wearer's skin surface. In some aspects, after the surface treatment is applied to form the wipe zone structures on the lower-body garment, the surface treatment may also undergo a curing process. The curing process may be completed after each layer of surface treatment is applied or after all the layers of surface treatment are applied.

[0022] Turning now to the figures, FIG. 1 depicts a front view of an exemplary lower-body garment 100 comprising wipe zone structures 120 and 134 in accordance with aspects of the present disclosure. The exemplary garment in FIG. 1 is a lower-body garment 100 comprising a torso portion 102, a first leg portion 104, a second leg portion 106, a waist opening 108, a first leg opening 110, a second leg opening 112, and a waistband 126. When the lower-body garment 100 is worn, the first leg portion 104 may be adapted to cover at least part of the right leg of the wearer while the second leg portion 106 may be adapted to cover at least a part of the left leg of the wearer. Additionally, lower-body garment 100 comprises an out-

er-facing surface 114 and an inner facing surface opposite the outer-facing surface 114 (not shown). The outer-facing surface 114 comprises at least a first zone 118 and a second zone 119 comprising wipe zone structures 120 and 134 that are adjacent to the first zone 118. Additionally, in exemplary aspects, each line 146, 148, 150, 152 and 154 of surface treatment deposited onto lower-body garment 100 to form the wipe zone structures 120 and 134 are separated by intervening spaces 156, 158, 160, and 162 where no surface treatment has been deposited. Lower-body garment 100 also includes a front aspect 128, a back aspect 130, and two side aspects 132 and 132' that are positioned laterally on the lower-body garment 100. Further, it is contemplated herein that a hypothetical vertical midline reference plane 116 may be used to divide lower-body garment 100 into generally equal halves.

[0023] Lower-body garment 100 may comprise at least a front and back panel joined together at one or more seam lines, or the lower-body garment 100 may be a seamless construction formed, for example, through a flat knit process, a weft knit process, or a weaving process. Alternatively, an aspect of lower-body garment 100 comprising panels may be constructed from three, four, five, etc., number of panels with three, four, five, etc., number of seam lines. Although lower-body garment 100 shown in FIG. 1 is depicted as a pair of knee length shorts, it is contemplated herein that lower-body garment 100 may be in the form of shorter shorts, long pants, three-quarter pants, capri-pants, mini-skirt, knee-length skirt, long skirt, skorts of different lengths, and the like, without departing from aspects herein. Additionally, in aspects, lower-body garment 100 may comprise optional pockets with pocket openings adjacent to an upper portion of the side aspects 132 and 132', although it is contemplated herein that pockets may be located at other portions of the lower-body garment 100. Any and all aspects, and any variation thereof, are contemplated as being within aspects herein.

[0024] Focusing on lower-body garment 100 in FIG. 1, lower-body garment 100 includes wipe zone structures 120 and 134 that are strategically located for wiping away moisture and/or other particulate matter away from the wearer's skin upon contact with the wearer's skin. The wipe zone structures 120 and 134 are located in the second zone 119 and are adjacent to the first zone 118 on the front aspect 128 of the torso portion 102, and at least part of both the first leg portion 104 and second leg portion 106 on the outer-facing surface 114. As depicted in FIG. 1, the wipe zone structures 120 and 134 are formed by depositing a surface treatment at one or more predetermined locations on either side of the vertical midline reference plane 116 on the front aspect 128 of the lower-body garment 100 in a repeating array or pattern 124 where the wipe zone structures 120 and 134 may generally mirror one another in relation to the vertical midline reference plane 116. The formation of the wipe zone structures 120 and 134 in this manner provides a mechanism for the efficient transfer of moisture and/or particulate matter from the wearer's skin surface to the wipe zone structures 120 and 134 upon contact with the wearer's skin. However, it is contemplated that the application of the wipe zone structures 120 and 134 could also vary with respect to the vertical midline reference plane 116 such that the first leg portion 104 has a different repeating pattern 124 than the second leg portion 106. Additionally, the wipe zone structures 120 and 134 on the outer-facing surface 114 of the torso portion 102, the first leg portion 104, and the second leg portion 106 may be located solely on the front aspect 128 of lower-body garment 100, the side aspects 132 and 132', the back aspect 130, or in any combination or variation thereof.

[0025] With this positioning, the wipe zone structures 120 and 134, respectively, are readily accessible to the wearer for quickly wiping of his/her palms with a generally downward or sideways motion to wipe away moisture and/or particulate matter. Being able to quickly remove moisture and/or particulate matter from hands may be particularly useful in sports such as basketball, baseball, or tennis where hands are heavily involved because by alleviating the slippery nature of sweaty or wet hands, the athlete may have a better control of the ball, bat, or racquet, depending on the sport or position being played. The shape, angle, height, width and overall size of the wipe zone structures 120 and 134 and their positioning on lower-body garment 100 are configured to aid the wearer in readily removing moisture and/or particulate matter while wearing lower-body garment 100. It is also contemplated that there may be alternative positioning of the wipe zone structures 120 and 134 that will also provide a readily accessible means of quickly removing moisture and/or particulate matter from the wearer's hands. Any and all aspects, and any variation thereof, are contemplated as being within aspects herein.

[0026] FIG. 2 illustrates a side view of an exemplary lower-body garment 200 in accordance with aspects herein. In FIG. 2, the exemplary lower body-garment 200 is depicted again as a short. The wipe zone structures 202 are applied in a repeating pattern 212 at a diagonal on a first leg portion 216. Wipe zone structures 202, as depicted, extend along at least a side aspect 210 of a torso portion 214 of the garment 200. However, it is contemplated the wipe zone structures 202 may extend diagonally in varying configurations and any and all aspects contemplated herein are included. Additionally, the wipe zone structures 202 may extend from the front, outer-facing surface 208 of the lower-body garment 200 to the side aspects 210 of the lower-body garment 200. In some aspects, the lower-body garment 200 may additionally comprise a pocket where the wipe zone structures 202 may be configured to extend to an opening of the pocket. Further, while FIG. 2 illustrates the side aspect 210 of the exemplary lower-body garment 200 and depicts one set of wipe zone structures 202, it is contemplated that a second leg portion of the garment 200 may contain a second set of wipe zone structures (not depict-

ed) that mirrors wipe zone structures 202.

[0027] FIG. 3 depicts a rear review of an exemplary lower-body garment 300. The wipe zone structures 302 and 304 may comprise a single wipe zone structure 306 that is configured to extend across the back aspect 308 of the lower-body garment 300, as shown, at an area that is adapted to overlay a lower back torso area of a wearer when the lower-body garment 300 is worn. In exemplary aspects, the upper edges of wipe zone structures 302, 304 and 306 may abut waistband 312 at the bottom edge 314, or may lie a uniform distance 316 away from waistband bottom edge 314 such that the upper edges of wipe zone structures 302, 304, and 306 are parallel to the waistband bottom edge 314. The wipe zone structures 302, 304, and 306 may comprise a uniform width throughout as shown in FIG. 3 or each wipe zone structure's width may vary. Additionally, the wipe zone structures may or may not comprise a uniform length. In FIG. 3, wipe zone structures 330, 332, and 334 are the same length and extend across the width of the back aspect 308 of the lower-body garment 300, while wipe zone structures 336 and 338 extend across only a portion of the back aspect 308 of the lower-body garment 300. However, in other aspects, the wipe zone structures may all be the same uniform length as seen in FIG. 1. While FIG. 3 depicts the wipe zone structures 302, 304, and 306 on the back aspect 308 of the lower-body garment 300, it is contemplated that the wipe zone structures 302, 304, and 306 may extend to the sides and front aspects of the lower-body garment 300 in various aspects. For example, the lower-body garment 300 may comprise wipe zone structures configured as depicted in FIG. 1 on the front aspect of the lower-body garment 300 in addition to the wipe zone configuration depicted on the back aspect 308 of the lower-body garment 300 in FIG. 3. Any and all aspects, and any variation thereof, are contemplated herein.

[0028] In FIG. 3, the wipe zone structures 302, 304, and 306 comprise a surface treatment has been deposited in a repeating pattern 320 on the back aspect 308 of the lower-body garment 300. As seen in FIG. 3, the repeating pattern 320 located in the second zone 322 is positioned on both sides of the hypothetical vertical midline reference plane 310. The wipe zone structures 302, 304, and 306 are depicted as being located on the upper portion 326 (including the upper portion 326 and leg portions 324/326) of the outer-facing surface 328 of the lower-body garment 300 stopping at an area proximate to the waistband 312 (i.e., within 2 cm to 20 cm of the waistband 312). The wipe zone structures 302, 304, and 306 comprise the lines 330, 332, 334, 336, and 338 of the surface treatment that are separated from each adjacent line of surface treatment by intervening spaces 340, 342, 344, and 348. As depicted, no surface treatment has been applied at intervening spaces 340, 342, 344, and 348. Once again, in exemplary aspects, the first zone 324 may remain free of any wipe zone structures. It is contemplated that a wearer, while active, could reach behind their torso and mechanically remove moisture and/or particulate matter from their hands by mechanically wiping their hands on the wipe zone structures 302, 304, and 306, resulting in the transfer of the moisture and/or particulate matter from the wearer's skin surface to the wipe zone structures 302, 304, and 306.

[0029] Although FIGS. 1-3 illustrate exemplary lower-body garments having wipe zone structures, it is contemplated that upper-body garments may comprise similar wipe zone used to wipe away moisture and/or particulate matter. As discussed with respect to FIG. 4, aspects of the disclosure include upper-body garments having one or more wipe zone structures.

[0030] As previously mentioned, during physical activity, individuals often find the need and desire to remove moisture and/or particulate matter, particularly from his or her face. As background, when an individual exerts themselves physically, they will likely sweat from their head. As the physical exertion continues and/or becomes more intense, the sweat from the head will likely increase and start to drip on the forehead into the face, including into the eyes. Additionally, an individual may come in contact with different surfaces during physical activity and their skin surface may accumulate different particulate matter in addition to moisture. This may create discomfort. Oftentimes, a person who is engaged in a physically demanding activity will carry a towel with them. However, having to carry a towel around is often cumbersome, and once the towel becomes saturated, the towel may become ineffective for its intended purpose. If a towel is unavailable, a person may take the forearm portion of a sleeve of his or her upper-body garment and move their arm up towards the individual's face, and use the forearm portion of the sleeve to wipe away the moisture and/or particulate matter on his or her face.

[0031] Taking this motion into account, FIG. 4 depicts an exemplary upper-body garment 400 having at least a right forearm portion 410 and a left forearm portion 412. Although the garment 400 in FIG. 4 is depicted as a long-sleeved crew neck shirt, it is contemplated herein that the upper-body garment 400 may be in the form of a long-sleeved V-necked t-shirt, a short sleeved crew neck t-shirt, a short sleeved V neck t-shirt, a short or long sleeved hoodie, a short or long sleeved sweater, a thin, medium, or thick jacket, and the like, without departing from aspects herein. The upper-body garment 400 comprises a first zone 402, where no wipe zone structures are located. In exemplary aspects, the first zone 402 may comprise the majority of the upper-body garment 400 as illustrated. The upper-body garment 400 may have wipe zone structures 404 on the right forearm 410 and wipe zone structures 406 on the left forearm 412. Wipe zone structures 404 and 406 comprise a repeating pattern 440 of surface treatment that has been deposited onto the outer-facing surface 414 of the front aspect 416 of the upper-body garment 400. The wipe zone structures 404 and 406 may extend over at least lateral portions 418 and 420 of the wearer's right forearm 410 and left forearm

412, respectively, when the upper-body garment 400 is worn. The wipe zone structures 404 and 406, respectively, may be used to remove moisture and/or particulate matter from a wearer's forehead, taking advantage of the natural tendency to use the arm to wipe away moisture and/or particulate matter from the forehead. While not shown, it is contemplated that wipe zone structures 404 and 406 may continue to the side aspects of the forearm portions 410/412 of upper-body garment 400.

[0032] It is contemplated that the wearer could lift the right forearm 410, left forearm 412, or both and mechanically wipe away moisture and/or particulate matter that has gathered on various parts of their body including, but not limited to their hands, face, neck, and head area. The raised surface of the wipe zone structures 404 and 406 on the right forearm 410 and left forearm 412 comprising the surface treatment allows for the transfer of the moisture and/or particulate matter from the wearer's skin surface to the wipe zone. Although the wipe zone structures 404 and 406 on the upper-body garment 400 are depicted as a repeating linear pattern 440, any variation of a repeating pattern (e.g., circles, triangles, squares, organic shapes, and the like) are contemplated as being within the scope herein. Additionally, the size and shape of the wipe zone structures 404 and 406 may be varied according to the functionality and aesthetic appeal desired for the particular garment. Further, while each arm portion contains wipe zone structures 404/406 in the exemplary upper-body garment 400, it is contemplated that in some aspects only one arm portion, such as the right forearm portion 410, might contain the wipe zone structures 404. Once again, the plurality of separate and distinct lines, such as lines 424, 426, and 428 that make up the repeating pattern 440 forming the wipe zone structures 404 and 406 are separated from one another by intervening spaces 430, 432, and 434. Positioning the wipe zone structures 404 and 406 on the outer-facing surface 414 of the right and left forearms 410 and 412 leverages the wearer's natural tendency to bring their forearm towards their face or head to wipe away moisture and/or particulate matter from the wearer's head or face.

[0033] FIGS. 5-7 depict close-up views of exemplary surface treatment pattern configurations in accordance with aspects herein. FIG. 5 depicts an exemplary wipe zone structure configuration depicted in the exemplary lower-body garment 100 of FIG. 1. A horizontally oriented pattern 124 of surface treatment has been deposited to form wipe zone structures 120 and 134 in FIG. 1. In this close-up view, the plurality of separate and distinct lines 146, 148, and 150 comprise the repeating horizontal pattern 124 of wipe zone structures 120 and 134. Each line 146, 148, and 150 is separated from the adjacent lines by intervening spaces 156 and 158.

[0034] FIG. 6 depicts an alternate exemplary wipe zone structure configuration of the wipe zone structures 202 depicted in the exemplary lower-body garment 200 of FIG. 2. In this aspect, the plurality of lines 220, 222, and 224 have been deposited so as to have a diagonal orientation with respect to, for instance, a bottom margin of the garment 200. The intervening spaces 226 and 228 where no wipe zone structures are located are also shown.

[0035] FIG. 7 further illustrates yet another alternate arrangement of wipe zone structures 614 in accordance with aspects herein. The wipe zone structures 614 comprise an alternating pattern 606. In this aspect, the alternating pattern 606 comprises sets of wipe zone structures 608 and 610 that are arranged in rows, each adjacent row partially overlapping the other. Further, each line 608 and 610 comprising wipe zone structures 614 remains separated by intervening space 612. In FIGS. 5-7, the different configurations of the patterns of the wipe zone structures may be engineered based on the desired apparel type or activity. Further, in each aspect, the wipe zone structures are designed to provide for easy mechanical removal of moisture and/or particulate matter from the skin of the wearer to the wipe zone structures.

[0036] FIG. 8 depicts a cross-sectional view of an exemplary line 144 of wipe zone structure 120 of FIG. 5 at cut line 8-8. The surface treatment 122 applied to create the wipe zone structure 120 may be applied through a multi-layer screen printing process to produce at least one raised surface 162 for wiping away moisture and/or particulate matter from the wearer's skin surface. Although described as being applied through a multi-layer screen printing process, it is contemplated herein that the wipe zone structure 120 may be created through a single layer application process. Additionally, each line 144 comprising the surface treatment 122 applied to the garment 100 that results in the wipe zone structure 120 may have a predetermined height 164. Each line may have a predetermined height 164 that is between 4.0-6.0 millimeters, 3.5-7.5 millimeters, or 4.0-6.0 millimeters. The height 164 is such that it allows the wipe zone structures to function without creating an annoyance, unattractive appearance, or discomfort for the wearer. Further, each line 144 may have a predetermined width between 0.5-3.0 millimeters, 1.0-2.5 millimeters, or 1.5-3.5 millimeters. The height and width of each line of surface treatment applied to form the wipe zone structure may vary depending on the type of surface treatment used and apparel item.

[0037] Depending on the garment, the wipe zone structures may have a shape and size that is both suitable for its intended purpose and, at the same time, is aesthetically appealing. Turning back to FIGS. 1 and 2, for instance, the wipe zone structures 120, 134, and 202 of garments 100 and 200 each comprise a linear rectangular repeating shape. However, it is contemplated that the wipe zone structures may assume different shapes. It is similarly contemplated that additional configurations may be used while still being easily accessible to, for example, the wearer's hands.

[0038] FIG. 9A depicts a cross-sectional view of an exemplary wipe zone structure 700. In FIG. 9A, the wipe zone structure 700 is comprised of several repeating

lines of surface treatment 702 that have been deposited in multiple layers 704, 706, and 708 to form wipe zone structure 700 for wiping away moisture and/or particulate matter from the wearer's skin surface. FIG. 9A depicts a configuration of the wipe zone structure 700 where the edges of the wipe zone structure 700 are squared off forming generally 90 degree angles at edge 710. The squared off edge 710 of the wipe zone structure 700 may be configured so that when the individual moves their hands across the wipe zone structure 700, the edge 710 is able to mechanically remove moisture and/or particulate matter from the wearer's skin surface smoothly, without irritating the skin or causing any discomfort to the individual.

[0039] FIG. 9B depicts an cross-sectional view of an alternate geometry of an exemplary wipe zone structure, where the wipe zone structure 800 may comprise multiple layers of surface treatment 802, 808, and 810 that have been applied to the garment 806 via, for instance, a screen printing process as in FIG. 9A. However, the edges of the wipe zone structure 800 have been rounded off creating a smooth-rounded edge 804.

[0040] FIG. 9C depicts yet another cross-sectional view of an alternate geometry of a wipe zone structure 900. In FIG. 9C, the wipe zone structure 900 comprises layers of surface treatment 906, 908, and 910 that have been applied to the garment 904 to form an apex 902. As indicated above, the lines of surface treatment applied to form the wipe zone structures may vary in height, width, and geometry based on the desired apparel type. The different geometries may provide different advantages to an individual using the wipe zone structure based on the type of activity they may be engaged in. For example, an individual playing basketball or beach volleyball may find themselves accumulating more particulate matter on their hands than an individual playing tennis. Accordingly, wipe zone structures comprising patterns of surface treatments with edges that have triangular edges or squared off edges as depicted in FIGS. 9A and 9C may be more advantageous for the basketball or beach volleyball player so that they can quickly and efficiently wipe off more moisture and/or particulate matter from their skin surface than a smooth-rounded edge depicted in FIG. 9B.

[0041] FIG. 10 depicts the use of wipe zone structures located on the back aspect 1010 of an exemplary lower body garment 1004. In FIG. 10, the athlete 1000 is seen using the wipe zone structures 1002, 1006, and 1008 located on the back aspect 1010 on the outer-facing surface of the exemplary lower-body garment 1004. In this aspect, the athlete 1000 is mechanically wiping his hands 1012 over the wipe zone structures 1002, 1006, and 1008 to remove moisture and/or particulate matter from the skin surface.

[0042] FIG. 11 depicts the use of wipe zone structures on the front aspect 1108 of an exemplary lower-body garment 1100. In this aspect, the wipe zone structures 1104 and 1106 are located on the front aspect 1108 of the lower-body garment 1100. The athlete 1110 is seen mechanically wiping his hands 1102 on the wipe zone structures 1104 and 1106 to remove moisture and/or particulate matter. The wipe zone structures 1002, 1006, 1008, 1104, and 1106 depicted in FIGS. 10-11 demonstrate the use of the wipe zone structures during physical activity. By creating such wipe zone structures on the exemplary garments, the athlete does not have to stop their activity or carry additional items, such as a towel, to remove moisture and/or particulate matter from their skin surface. This saves time and is convenient for athletes during a game. In these examples, the wipe zone structures 1002, 1006, 1008, 1104, and 1106 are depicted as being on the back aspect 1010 of the lower-body garment 1004 and the front aspect 1108 of exemplary lower-body garment 1100. However, it is contemplated that in other aspects, there may be wipe zone structures located on the side aspect or in some combination of the front, side, and back aspects of the lower-body garment. Any and all aspects, and any variation of the location of the wipe zone structures are contemplated as being within the scope herein.

[0043] Finally, FIG. 12 depicts an exemplary method 1200 for manufacturing a wipe zone structure on a lower-body garment, such as the exemplary wipe zone structures 120 and 134 of lower-body garment 100 shown in FIG. 1. For example, the wipe zone structures 120 and 134 may be manufactured by providing a lower-body garment at block 1202. The lower-body garment may comprise a torso portion, a first leg portion extending from the torso portion, a second leg portion extending from the torso portion, the torso portion defining at least a waist opening, and the first leg portion and the second leg portion defining a first leg opening and a second leg opening.

[0044] Next, at least one layer of surface treatment is applied in a repeating pattern to at least one portion of the lower-body garment at block 1204. The at least one layer of surface treatment may be applied to a portion of a front aspect of the torso portion, a portion of the front aspect of the first leg portion, a portion of a front aspect of the second leg portion, a portion of a back aspect of the torso portion, a portion of the back aspect of the first leg portion, and a portion of the back aspect of the second leg portion, or in any combination thereof. The application of the at least one layer of surface treatment to these locations forms one or more wipe zone structures on the lower-body garment at block 1206 for the mechanical removal of moisture and/or particulate matter from a wearer's skin surface.

[0045] In exemplary aspects, the wipe zone structures may be formed on only the front aspects of the lower-body garment, on only the back aspects of the lower-body garment, on only the side aspects of the lower-body garment, or in some combination of both the front and back aspects of the lower-body garment. As described above, the surface treatment applied to form the wipe zone structures may comprise an elastomeric polymer, a foam ink, or some combination thereof. Any and all aspects, and any variation of the surface treatment com-

position are contemplated as being within the scope herein. Additionally, in order to create the at least one wipe zone structure, the surface treatment may be applied through a single or multiple layer application process. Finally, in exemplary aspects, block 1204 may comprise an optional step of curing each layer of surface treatment subsequent to its application to the lower-body garment.

[0046] Aspects of the present invention have been described with the intent to be illustrative rather than restrictive. Alternative aspects will become apparent to those skilled in the art that do not depart from its scope. A skilled artisan may develop alternative means of implementing the aforementioned improvements without departing from the scope of the present invention.

[0047] It will be understood that certain features and subcombinations are of utility and may be employed without reference to other features and subcombinations and are contemplated within the scope of the claims. Not all steps listed in the various figures need be carried out in the specific order described.

[0048] In view of the above, the present application discloses aspects and/or embodiments as described in the following itemized list:

1. A lower-body garment comprising: a torso portion, a first leg portion extending from the torso portion, and a second leg portion extending from the torso portion, wherein the torso portion defines at least a waist opening, and further wherein the first leg portion and the second leg portion define a first leg opening and a second leg opening respectively; an inner-facing surface; and an outer-facing surface opposite the inner-facing surface, wherein: a hypothetical vertical midline reference plane divides the lower-body garment into generally equal halves, the outer-facing surface comprises at least a first pattern of elastomeric polymer deposited on the outer-facing surface on a first side of the hypothetical vertical midline reference plane and a second pattern of elastomeric polymer deposited on the outer-facing surface on a second side of the hypothetical vertical midline reference plane, wherein the first side is opposite the second side with respect to the hypothetical midline reference plane.

2. The lower-body garment of item 1, wherein the lower-body garment comprises at least a front aspect, a back aspect, and two side aspects positioned laterally on the lower-body garment.

3. The lower-body garment of any one of the preceding items, wherein the elastomeric polymer is deposited on the lower-body garment in a location corresponding to at least the two side aspects of the lower-body garment.

4. The lower-body garment of any one of the preceding items, wherein the elastomeric polymer is deposited on the lower-body garment in a location corresponding to the back aspect of the lower-body garment.

5. The lower-body garment of any one of the preceding items, wherein the elastomeric polymer deposited comprises at least a first layer of silicone polymer and a second layer of silicone polymer deposited on the first layer of silicone polymer, wherein the first layer of silicone polymer has a width greater than the second layer of silicone polymer.

6. The lower-body garment of any one of the preceding items, wherein the elastomeric polymer has a height between 4 and 6 millimeters.

7. The lower-body garment of any one of the preceding items, wherein the first and second patterns comprise a plurality of separate and distinct lines of elastomeric polymer, each line of elastomeric polymer separated from an adjacent line of elastomeric polymer by an intervening space.

8. The lower-body garment of any one of the preceding items, wherein the elastomeric polymer is not deposited in the intervening space.

9. A lower-body garment comprising: a torso portion adapted to cover at least a lower torso area of a wearer when the lower-body garment is worn by the wearer; a first leg portion extending from the torso portion; a second leg portion extending from the torso portion, the torso portion defining at least a waist opening, the first leg portion and the second leg portion defining a first leg opening and a second leg opening respectively; and at least one wipe zone comprising a repeating linear pattern of foam ink deposited at one or more predetermined locations on the lower-body garment.

10. The lower-body garment of item 9, wherein the first leg portion and the second leg portion each comprise at least an anterior aspect and a posterior aspect, and wherein the wipe zone extends over a portion of the anterior aspect of the first leg portion and a portion of the anterior aspect of the second leg portion.

11. The lower-body garment of any one of items 9-10, wherein the first leg portion and second leg portion comprise a pocket adjacent a lateral seam line joining the anterior aspect and the posterior aspect, the at least one wipe zone being configured to extend to an opening of the pocket.

12. The lower-body garment of any one of items 9-11, wherein the at least one wipe zone further extends

over a portion of the posterior aspect of the first leg portion and the second leg portion.

13. The lower-body garment of any one of items 9-12, wherein the at least one wipe zone extends to an area proximate the waist opening of the lower-body garment.

14. The lower-body garment of any one of items 9-13, wherein the foam ink has a height between 2 and 2.5 millimeters.

15. The lower-body garment of any one of items 9-14, wherein the linear pattern comprises a plurality of separate and distinct lines of foam ink, each line of foam ink separated from an adjacent line of foam ink by an intervening space.

16. The lower-body garment of any one of items 9-15, wherein one or more additional portions of the lower-body garment do not have foam ink deposited thereon.

17. A method of manufacturing a wipe zone area on a lower-body garment, the method comprising: providing the lower-body garment comprising a torso portion, a first leg portion extending from the torso portion, a second leg portion extending from the torso portion, the torso portion defining at least a waist opening, the first leg portion and the second leg portion defining a first leg opening and a second leg opening respectively; and applying at least one layer of a surface treatment in a repeating pattern to at least one of a portion of an anterior aspect of the first leg portion, a portion of an anterior aspect of the second leg portion, a portion of a posterior aspect of the first leg portion, and a portion of a posterior aspect of the second leg portion to form one or more wipe zones.

18. The method of item 17, wherein the surface treatment comprises an elastomeric polymer.

19. The method of any one of items 17 or 18, wherein the surface treatment comprises a foam ink.

20. The method of any one of items 17-19, wherein the surface treatment is applied via a multi-layer screen printing process.

Claims

1. A lower-body garment (100) comprising:

a torso portion (102) adapted to cover at least a lower torso area of a wearer when the lower-body garment is worn by the wearer;

a first leg portion (104) extending from the torso portion (102);

a second leg portion (106) extending from the torso portion (102), the torso portion (102) defining at least a waist opening (108), the first leg portion (104) and the second leg portion (106) defining a first leg opening (110) and a second leg opening (112) respectively; and

at least one wipe zone (120, 134) comprising a repeating linear pattern of foam ink deposited at one or more predetermined locations on the lower-body garment (100).

2. The lower-body garment (100) of claim 1, wherein the first leg portion (104) and the second leg portion (106) each comprise at least an anterior aspect and a posterior aspect, and wherein the wipe zone (120, 134) extends over a portion of the anterior aspect of the first leg portion (104) and a portion of the anterior aspect of the second leg portion (106).

3. The lower-body garment (100) of claim 2, wherein the first leg portion (104) and second leg portion (106) comprise a pocket adjacent a lateral seam line joining the anterior aspect and the posterior aspect, the at least one wipe zone (120, 134) being configured to extend to an opening of the pocket.

4. The lower-body garment (100) of claim 2, wherein the at least one wipe zone (120, 134) further extends over a portion of the posterior aspect of the first leg portion (104) and the second leg portion (106).

5. The lower-body garment (100) of claim 1, wherein the at least one wipe zone (120, 134) extends to an area proximate the waist opening (108) of the lower-body garment (100).

6. The lower-body garment (100) of claim 1, wherein the foam ink has a height between 2 and 2.5 millimeters.

7. The lower-body garment (100) of claim 1, wherein the linear pattern comprises a plurality of separate and distinct lines of foam ink, each line of foam ink separated from an adjacent line of foam ink by an intervening space (156).

8. The lower-body garment of claim 1, wherein one or more additional portions of the lower-body garment (100) do not have foam ink deposited thereon.

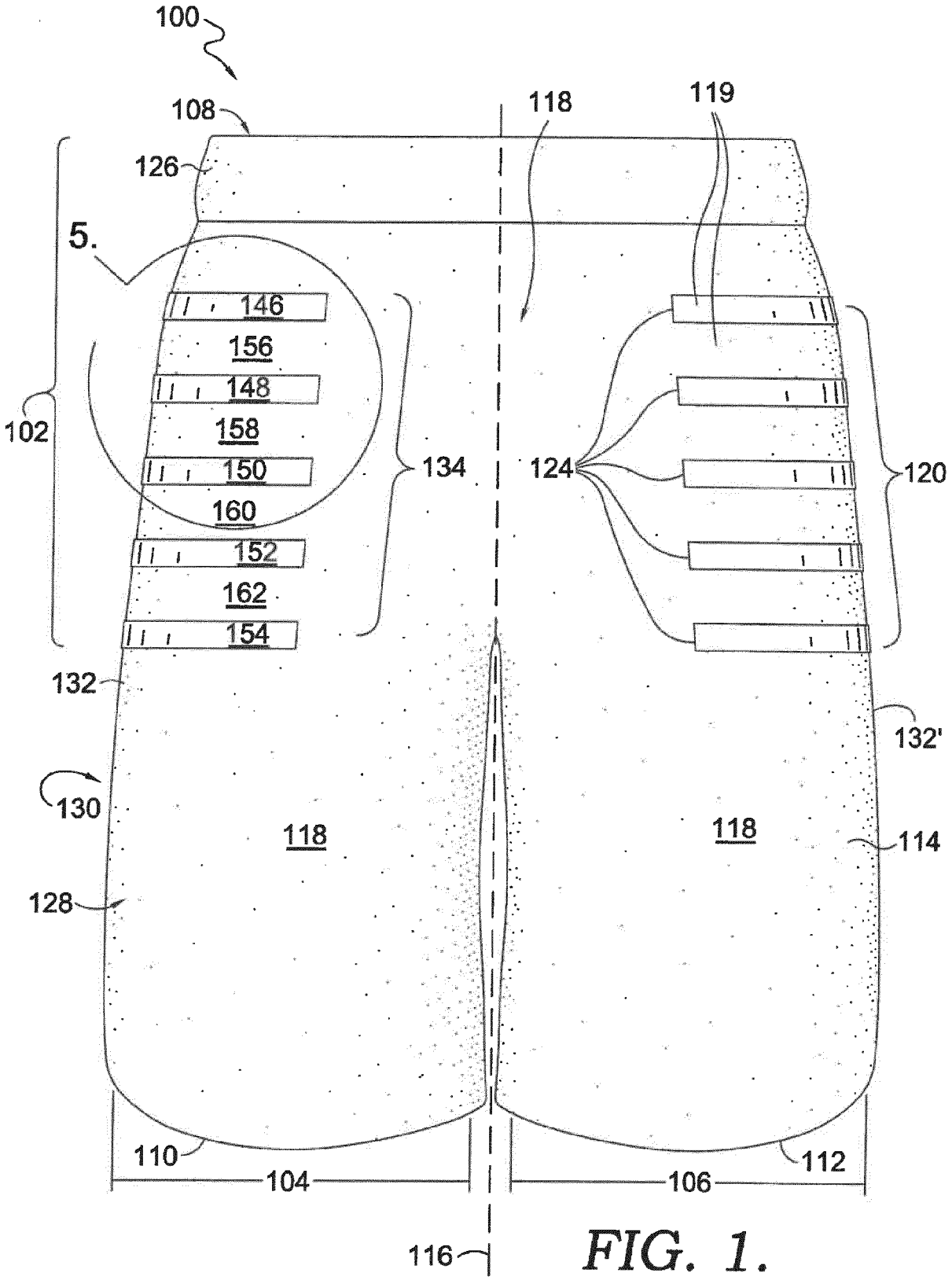
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FIG. 1.

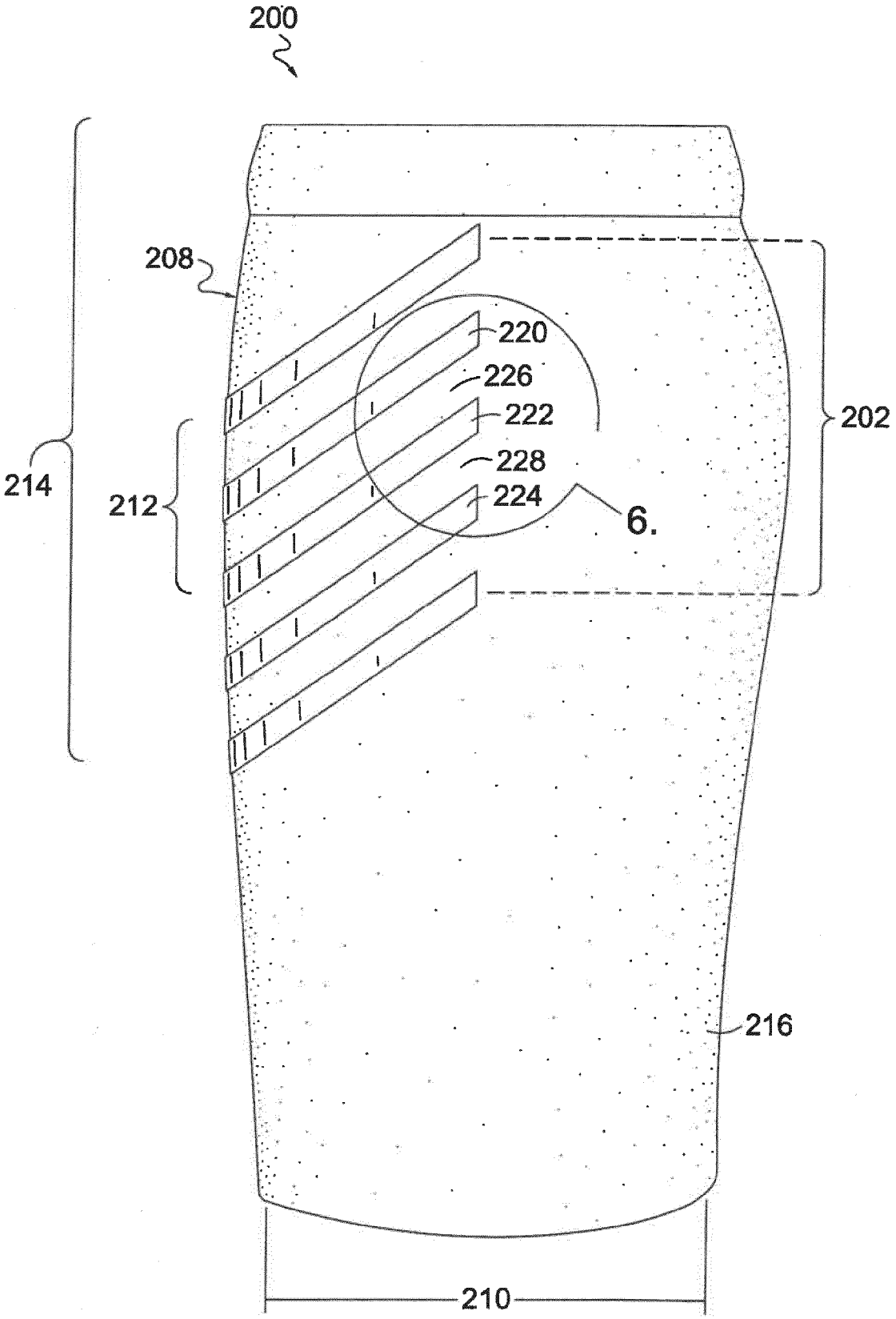

FIG. 2.

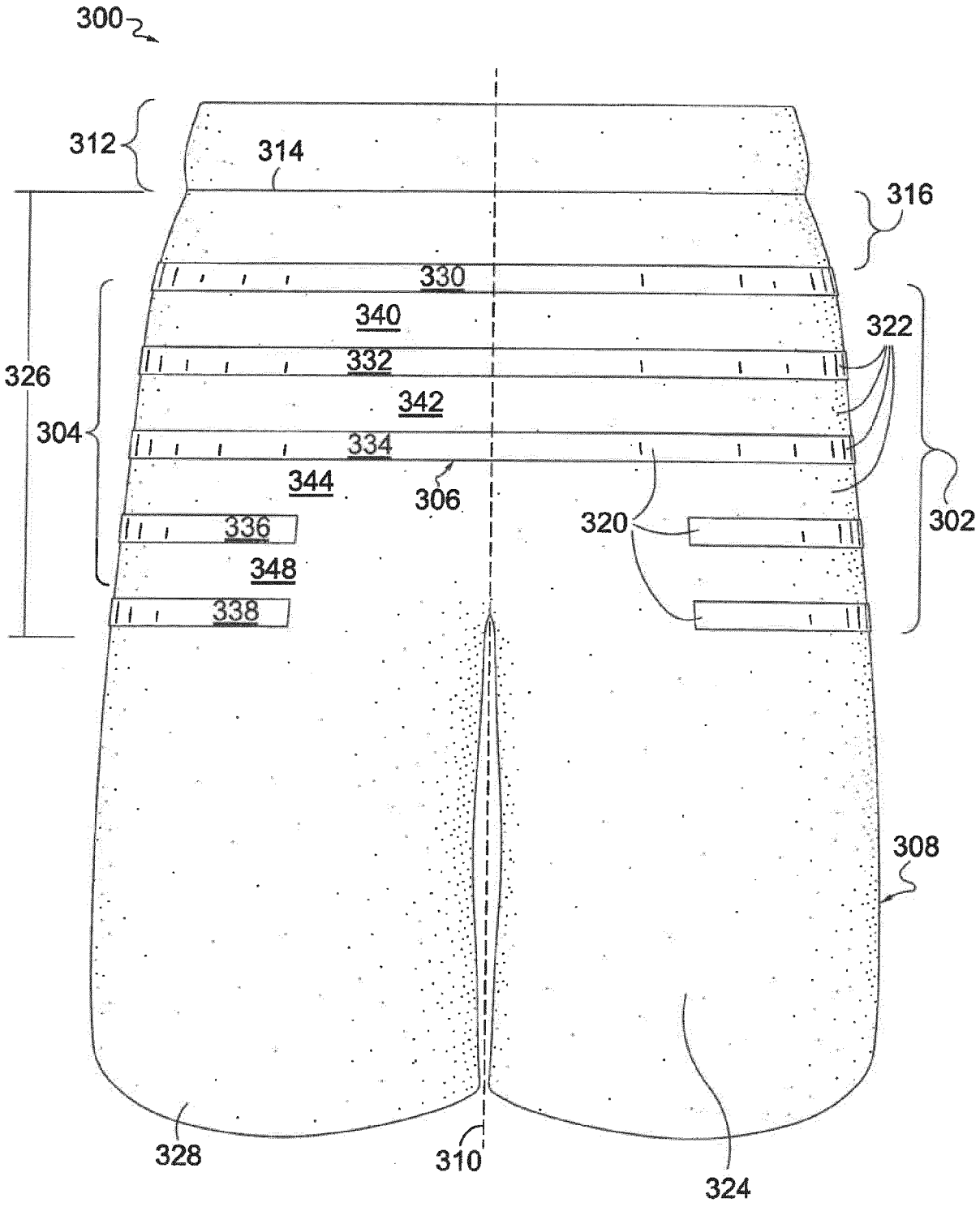
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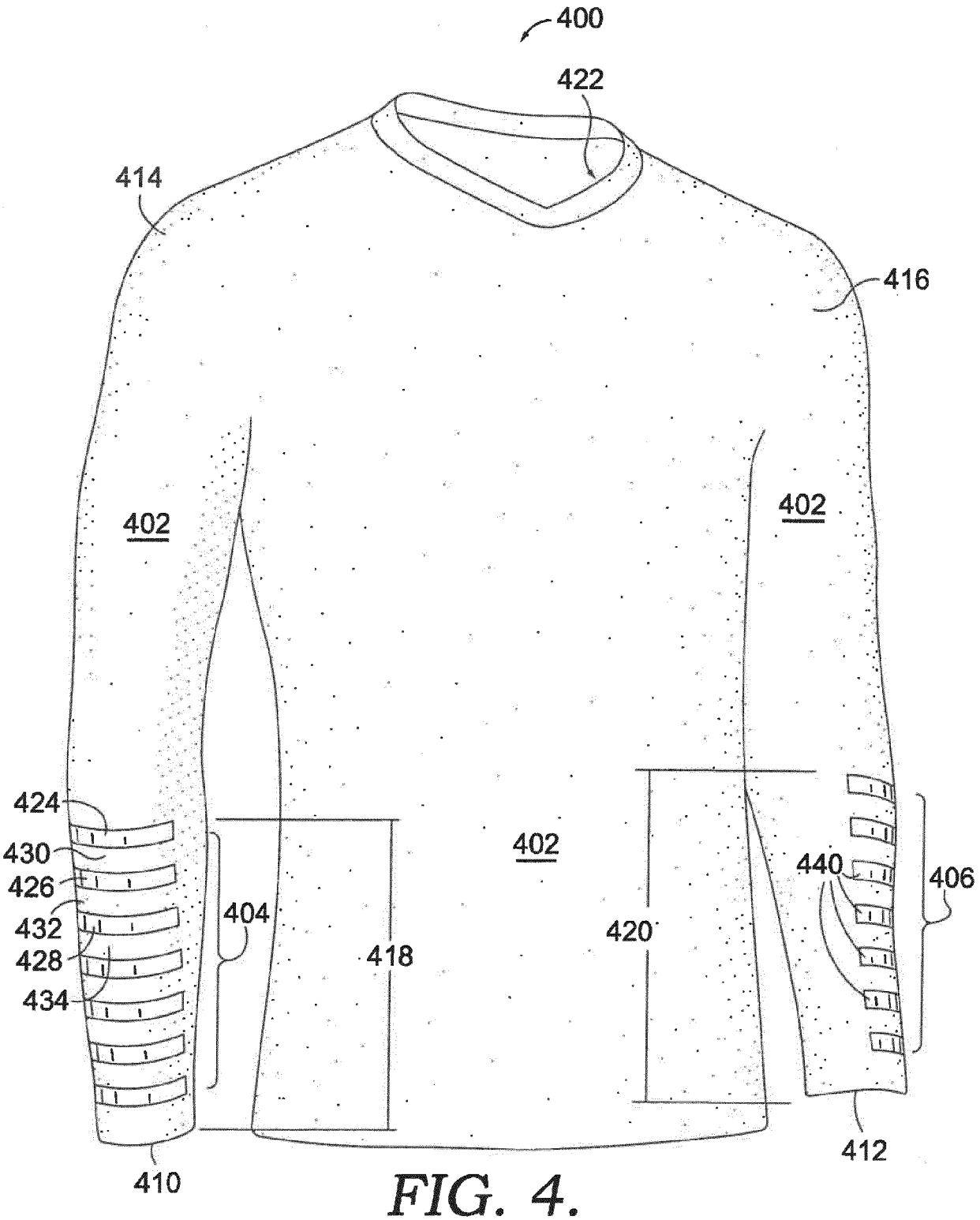
FIG. 3.


400
422
414
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412

FIG. 4.

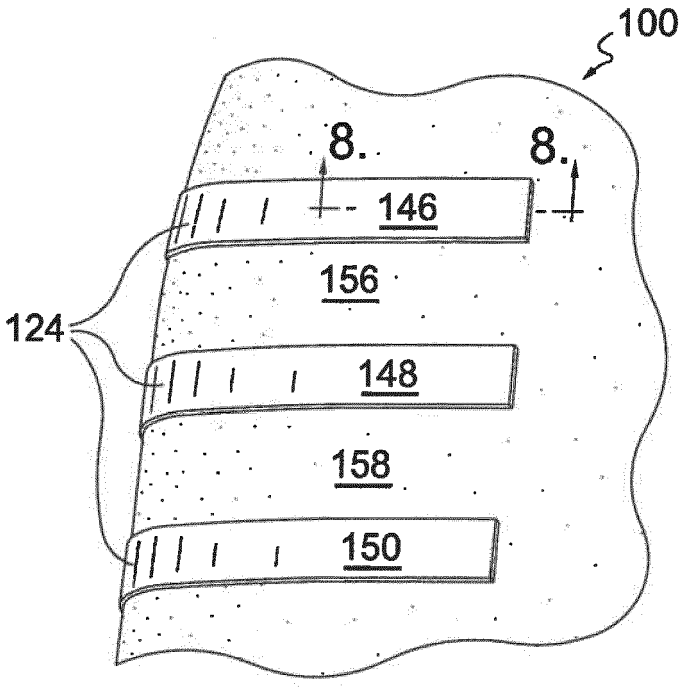

FIG. 5.

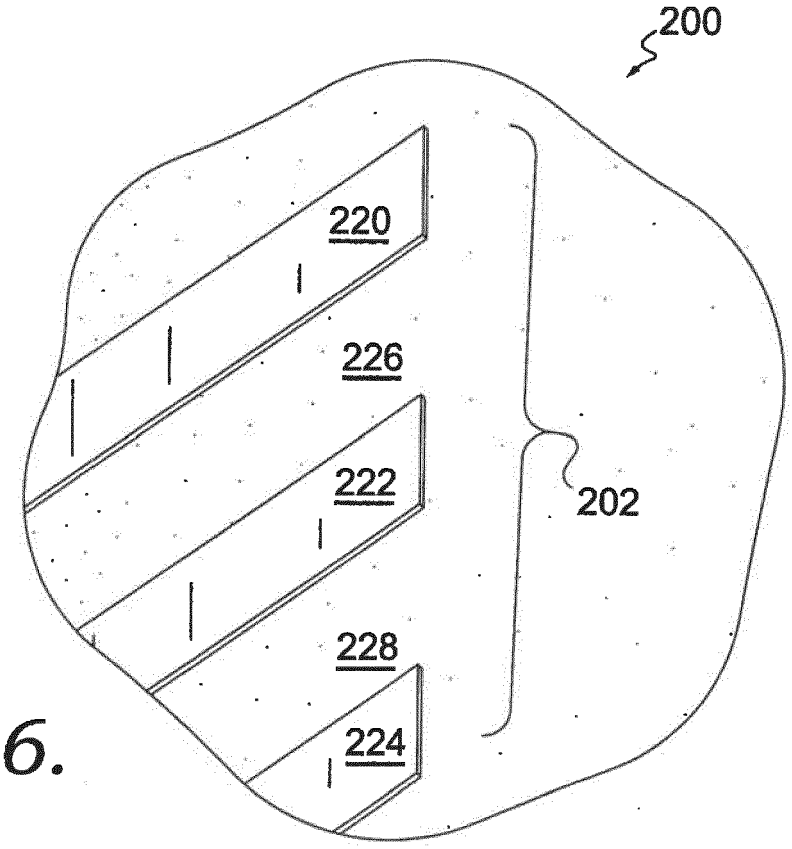

FIG. 6.

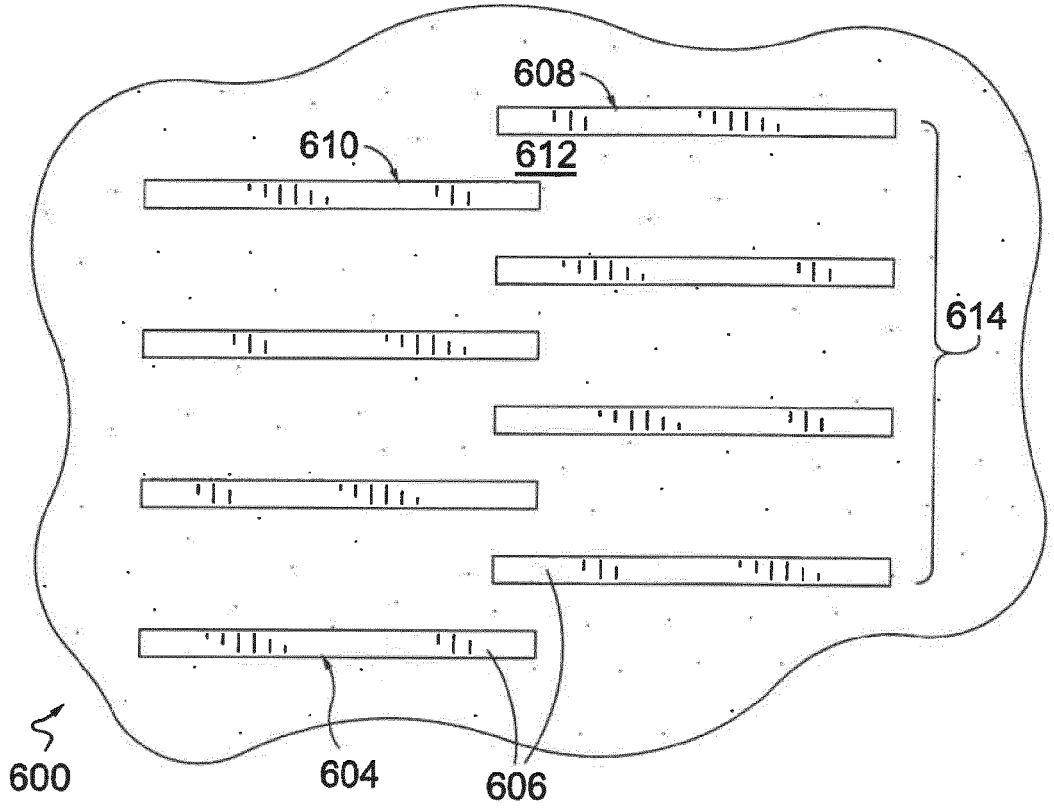

FIG. 7.

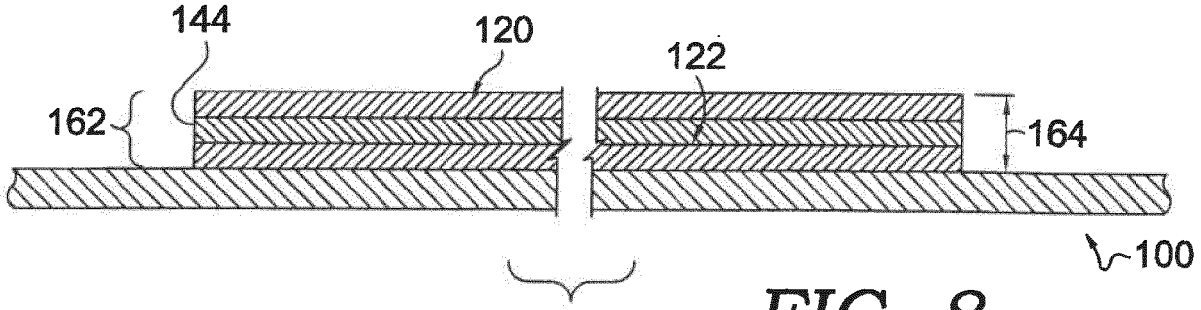

FIG. 8.

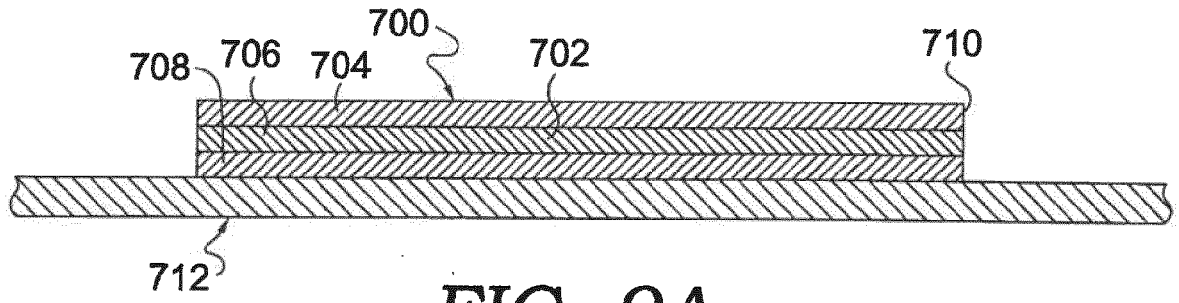

FIG. 9A.

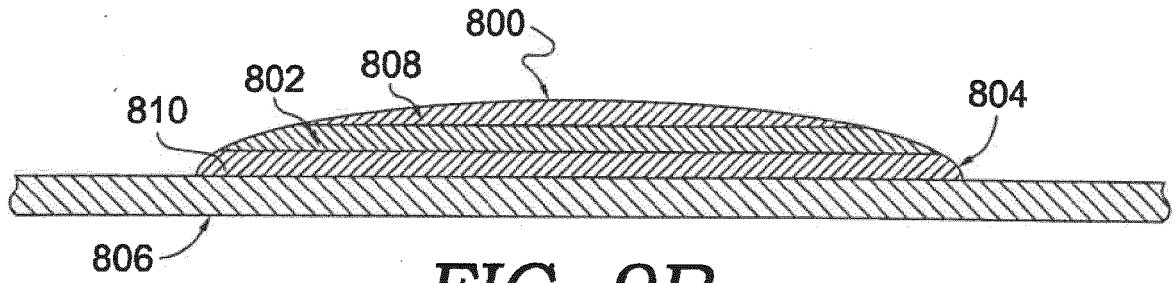

FIG. 9B.

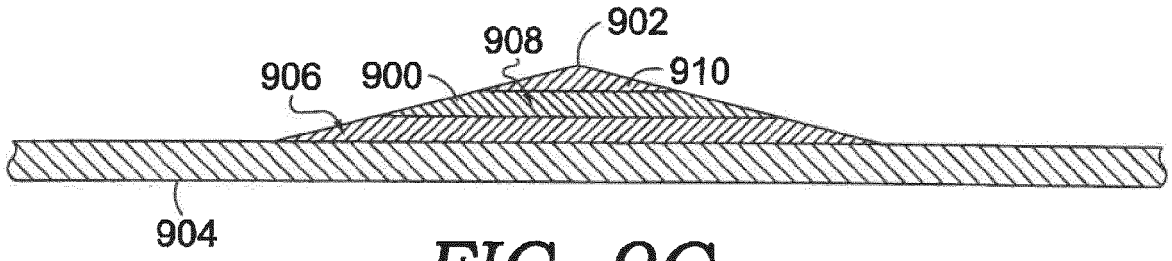

FIG. 9C.

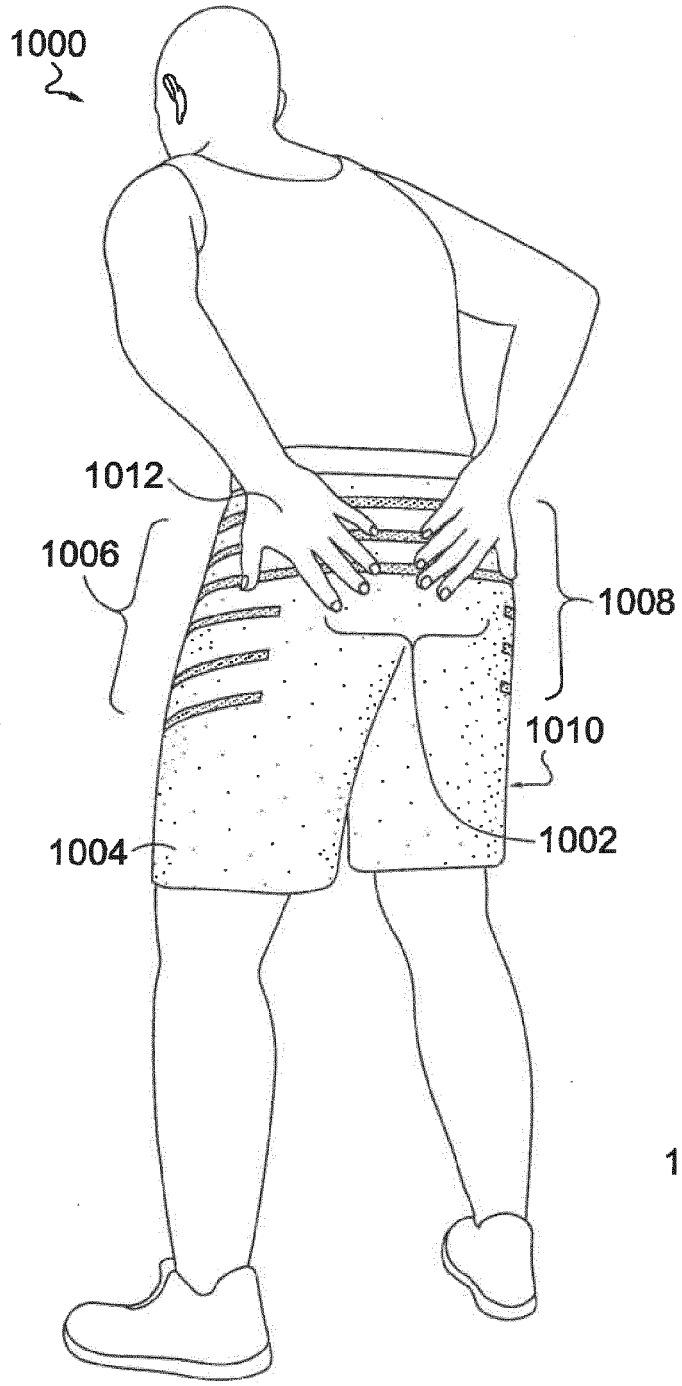
1000
1012
1006
1008
1010
1004
1002

FIG. 10.

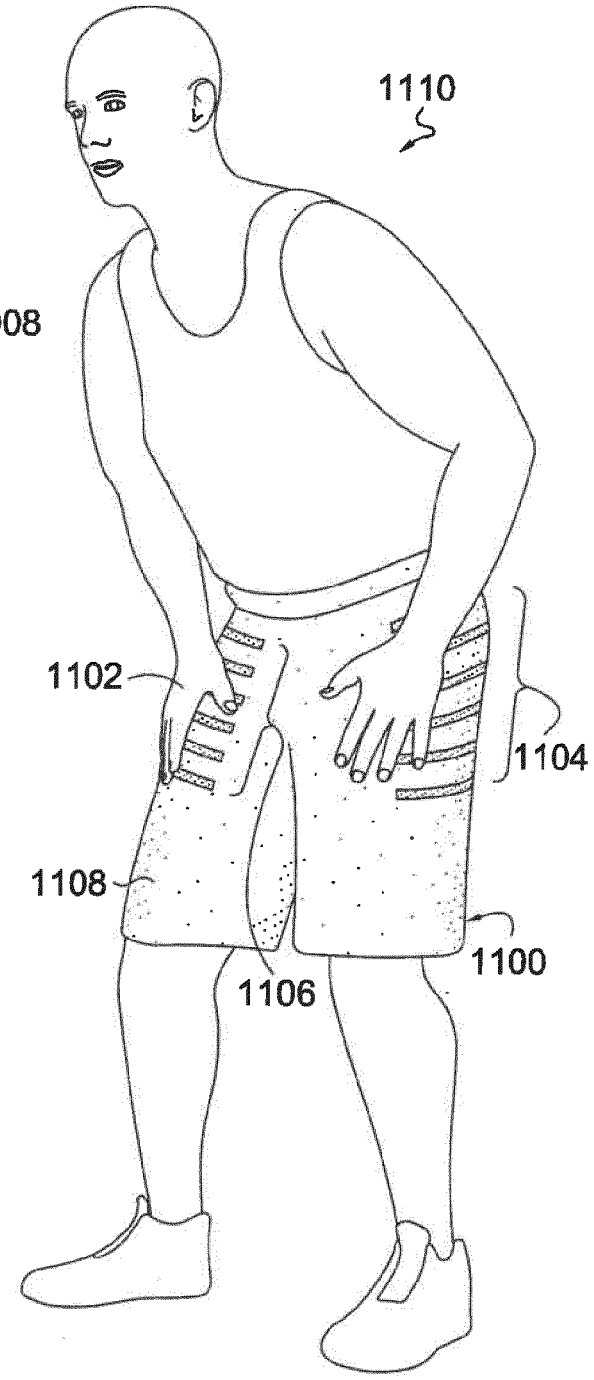
1110
1102
1104
1108
1100
1106

FIG. 11.

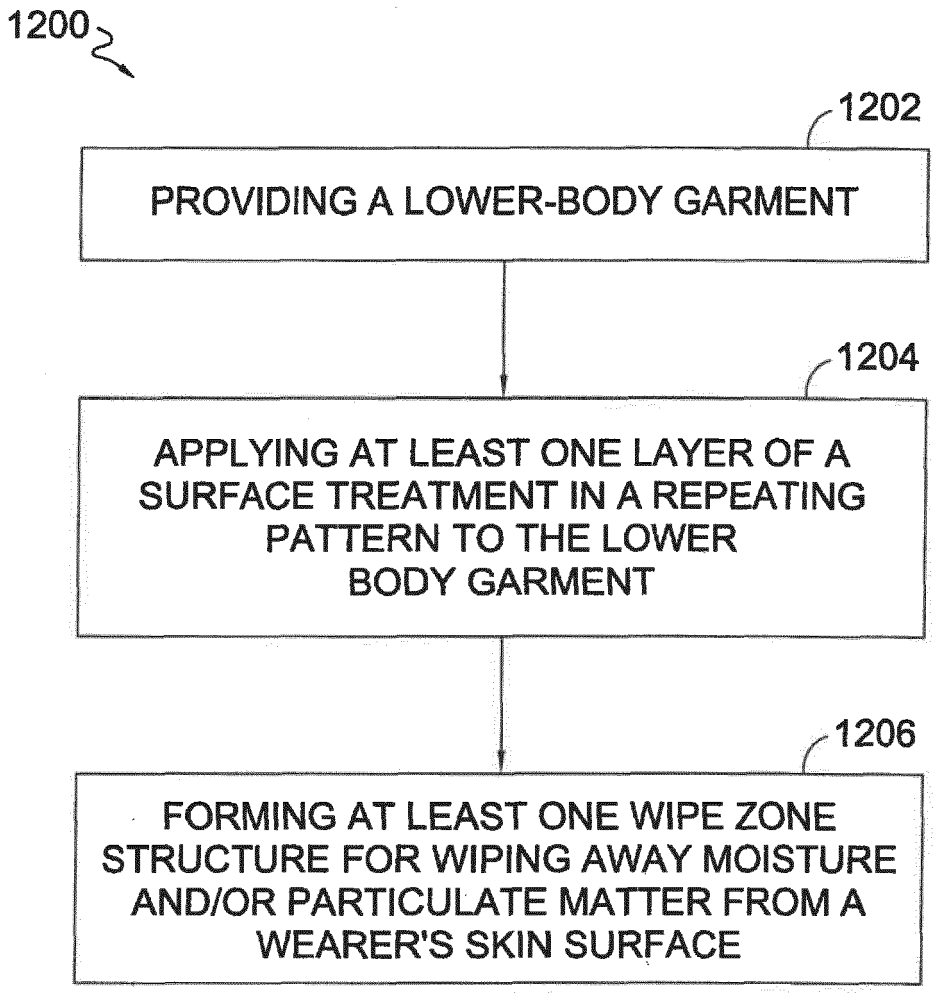
1200
1202
PROVIDING A LOWER-BODY GARMENT
1204
APPLYING AT LEAST ONE LAYER OF A SURFACE TREATMENT IN A REPEATING PATTERN TO THE LOWER BODY GARMENT
1206
FORMING AT LEAST ONE WIPE ZONE STRUCTURE FOR WIPING AWAY MOISTURE AND/OR PARTICULATE MATTER FROM A WEARER'S SKIN SURFACE

FIG. 12.

Europäisches Patentamt
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EUROPEAN SEARCH REPORT

Application Number
EP 21 20 9022

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
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A	CA 2 284 156 A1 (ROGERS GARY [CA]) 28 March 2001 (2001-03-28) * paragraphs [0005], [0013], [0015], [0019]; figure 1 *	1-8	
A	CN 205 285 040 U (FUJIAN QUANZHOU PEAK SPORT PRODUCTS CO LTD) 8 June 2016 (2016-06-08) * figure 1 *	1-8	
A	US 2017/071275 A1 (DARBY CHRISTIAN [US]) 16 March 2017 (2017-03-16) * paragraph [0087]; figure 1 *	1-8	
			TECHNICAL FIELDS SEARCHED (IPC) A41D

2 The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	31 January 2022	van Voorst, Frank

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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E : earlier patent document, but published on, or after the filing date
D : document cited in the application
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ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 21 20 9022

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
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31-01-2022

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