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On-demand agent dispensing devices and related methods

Abstract

The present disclosure provides on-demand agent dispensing patches, kits and related methods. A flexible patch is configured to provide on-demand dispensing of the agent via compression of the patch. The patch comprises: an adhesive layer to removably couple the patch to a surface; at least one reservoir layer overlying the adhesive layer configured to absorb and retain the agent therein; at least one dispenser layer overlying the at least one reservoir layer comprising a plurality of solid portions and an array of a plurality of openings configured to inhibit evaporation of the agent and control a flow of the agent therefrom upon the compression of the patch; and at least one backer layer between the adhesive layer and the at least one reservoir layer being substantially impervious to the agent. The at least one reservoir layer may be void of the agent, which may be provided in a container.

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Background/Summary

CROSS-REFERENCE TO RELATED APPLICATION (1) This application is a by-pass continuation-in-part of PCT International Application No. PCT/US2021/036212, filed Jun. 7, 2021, and entitled On-Demand Agent Dispensing Devices and Related Methods, which claims priority benefit under 35 U.S.C. § 119(e) of U.S. Provisional Patent Application No. 63/035,006, filed Jun. 5, 2020, and entitled On-Demand Agent Dispensing Devices and Related Methods, and also claims priority benefit under 35 U.S.C. § 119(e) of U.S. Provisional Patent Application No. 63/418,041, filed Oct. 21, 2022, and entitled Agent Dispensing Devices, Kits and Related Methods, which are incorporated herein by reference in their entireties.

FIELD OF THE DISCLOSURE

(1) The present disclosure relates generally to on-demand agent (e.g., disinfectant) dispensing devices, kits and related methods. More specifically, the present disclosure relates to agent (e.g., disinfectant) dispensing adhesive patches that are configured to be removably affixed to a user or surface, and provide on-demand dispensing of an agent over an extended period of time.

BACKGROUND

(2) There is substantial evidence that pathogens (i.e., disease-causing microorganisms, such as various viruses, bacteria, fungus, and parasites) can be transmitted from a first person to a second person via the first person physically touching the second person (e.g., via a handshake, hug, kiss, etc.) or the first person physically touching or otherwise infecting (e.g., via one or more respiratory function, a pet, etc.) a communal object (e.g., a surface, object, knob, button, handle, hand rail, key, screen, money, card, etc.) that is subsequently physically touched by the second person. Most commonly, pathogens are passed between people via physical touch through their hands—a pathogen becomes present on the first person's hand, and is transferred to the second person's hand via physical contact with the first person's hand or with an object that that first person's hand previously contacted or that the first person infected via one or more respiratory functions (e.g., breathing, coughing, sneezing, talking, etc.) or by a third party (e.g., via another person, a pet, etc.). Thus, not only can a person become infected by a pathogen by touching their eyes, nose or mouth with their hand (or with an object that they touched with their hand), they can pass a pathogen to one or more other people by touching a communal object.

(3) Because many infectious pathogens (such as viruses, for example the common cold) are contracted and spread to others via physical touching primarily by the hands, conventional medical wisdom teaches that the best way to prevent contraction and transmission of most pathogens (and resulting infections) is by thoroughly and frequently disinfecting/sanitizing/sterilizing one's hands throughout the day by washing their hands with soap and water. In addition to and/or in place of washing one's hands, a topical disinfecting/sanitizing/sterilizing agent such as, for example, a denatured alcohol, an anti-bacterial hand gel, or an anti-bacterial hand lotion to further protect the hands may be utilized.

(4) Although these measures will help to control the spread of many pathogens residing on the skin, they are ineffective if not performed routinely and methodically. Unfortunately, many individuals do not have immediate access to facilities to adequately wash their hands with soap and water, and/or to a topical disinfectant. For example, many liquid and/or gel topical disinfectants are packaged in a bottle configured with a spray or squeeze dispenser. These bottled disinfectants requires the bottle to be carried by an individual, taken out when disinfectant is needed, and manually opened and applied to their hand(s). As such, they are often not utilized as often as they should and/or would be compared to if they were easily available on-demand. As another example, sanitizing wipes or towelettes that contained a liquid topical disinfectant are sometimes utilized, but include the same disadvantages as bottled disinfectants.

(5) Hand sanitizer stations which contain a relatively larger reservoir of a topical disinfectant are also commonplace. Such stations are typically only found in high population spaces, areas where pathogens are more commonly found and/or areas where vulnerable people are located. Because of their scarcity, sanitizer stations thereby fail to protect users from the constant barrage of surfaces and 3rd party individuals comes into contact with on a daily basis.

(6) It is further noted that other liquid and/or gelatinous agents and materials that people wish to receive periodic doses of (or periodically dispense) suffer from the same deficiencies noted above with respect to disinfectant/sanitizer.

(7) It is thereby an object of the on-demand disinfectant dispensing devices and related disinfecting methods provided herein to addresses one or more of the aforementioned problems of the prior art. The on-demand agent dispensing devices, kits and related methods disclosed herein solve the above noted deficiencies of current agent dispensing devices and related methods by, inter alia, providing a removably affixable device/patch that provides on-demand access (via dispensing doses or amounts thereof) of a liquid and/or gelatinous agent (e.g., a disinfectant) to a user over an extended period of time.

SUMMARY

(8) On-demand agent (e.g., disinfectant) dispensing devices (and disinfecting methods utilizing such devices) that can be removably affixed to a user or surface that provide quick and easy access to the agent over an extended period of time are disclosed herein. The present disclosure provides such devices and kits, and related methods, for dispensing the agent onto a user's body (e.g., the skin of a user's hand) via an adhesive patch. In embodiments wherein the agent is a sanitizer/disinfectant liquid or gel, the devices, kits and methods provide for manual dispensing of the sanitizer/disinfectant to a user (e.g., a user hand), and potential transfer of the sanitizer/disinfectant to another portion of the user, another person or an inanimate object. Such on-demand disinfectant dispensing devices, kits and methods are thereby able to provide an on-demand sanitizer/disinfectant to one or more people and/or surfaces.

(9) The on-demand agent dispensing devices and kits provide simple, cost effective solutions to selectively provide access to, and dispensing of, a liquid or gelatinous agent, such as but not limited to alcohol-based sanitizer/disinfectant liquids or gels.

(10) The devices are self-contained, are void of containers that need to be carried and opened, retain the agent within the device (i.e., a no spill solution), and do not necessitate pouring or spraying for dispensing of the agent. In some embodiments, the on-demand agent dispensing devices and kits may be configured to with an adhesive patch that is configured to be removably affixed to a user, such as to the user's skin or the user's clothing (or any other inanimate object carried or worn by the user). In some embodiments, the on-demand agent dispensing patches are wearable, and may be configured to be removably affixed to an active point/portion of contact of the user that would benefit from having the agent at that location, such as sanitizer/disinfectant on the inside of a user's hand (e.g., on the palm and/or fingers). In some embodiments, the on-demand agent dispensing wearable device may be configured to be removably affixed to a passive portion of the user's skin (or an object worn/carried by the user) (or on an inanimate object remote from the user) that is spaced from the point/portion of contact of the user, to allow for selective application of the agent on the portion of contact of the user from the device. For example, a passive on-demand disinfectant dispensing wearable patch device may be configured to be removably affixed to the back of a user's hand (or a user's forearm) or on/in clothing worn by the user, and the user may wipe their finger(s)/hand on/over the device to apply the disinfectant thereto (and thereby disinfect their finger(s)/hand). In such a passive disinfecting embodiment, the on-demand disinfectant dispensing wearable device provides quick and discrete on-demand access to a sanitizer/disinfectant where swiping/contacting the device disinfects a person's point/portion of contact (e.g., their hand(s) or other skin surface).

(11) The on-demand agent dispensing device embodiments may be configured to be applied to an

active or passive surface portion of a user (or an object) to disinfect it, and, potentially, passes it on to a third party that subsequently touches the surface portion (i.e., pays it forward). In this way, the on-demand disinfectant dispensing devices can provide a level of disinfecting of safety to the user, with the additional benefit of protecting others that may touch a common surface/object. Communal touchpoints can thus be sanitized and provide an integral part to the health and wellbeing of a community as a whole.

(12) The on-demand agent dispensing devices of the present disclosure are configured as an on-demand long lasting liquid/gelatinous agent supply and dispensing patch. The on-demand agent supply and dispensing patch includes an adhesive layer or portion that is configured to removably attach to a user or an inanimate object. The on-demand agent supply and dispensing patch also includes at least one reservoir layer that is configured to absorb and retain the liquid/gelatinous agent therein, and at least one metered/controlled release or dispensing layer that overlies at least a portion of the at least one reservoir layer. The at least one metered/controlled release layer is configured to control the release (e.g., volume dispensed and pressure needed to dispense) of the agent at/to an outer surface of the patch (and thereby to a user) from the at least one reservoir layer, and mitigate/inhibit evaporation of the liquid/gelatinous agent in the at least one reservoir layer. In some embodiments, the on-demand agent supply and dispensing patch may include at least one backer layer positioned between the adhesive layer and the at least one reservoir layer that is impervious to the liquid/gelatinous agent such that the liquid/gelatinous agent is prevented from interacting with the adhesive of the adhesive layer, and is thereby retained above the at least one backer layer. In some embodiments, the at least one reservoir layer, the at least one metered/controlled dispensing layer and the at least one backer layer are heat welded or sealed together about the periphery of the patch, and form a peripheral barrier or border about an interior area or portion of the patch that substantially retains the agent within the at least one reservoir layer in the interior area of the patch until it is selectively dispensed by a user via pressure applied to the outer surface of the patch such that the at least one reservoir layer is compressed (in a thickness direction thereof).

(13) In one aspect, the present disclosure provides an on-demand liquid or gelatinous agent dispensing kit, comprising: a container containing a volume of a liquid or gelatinous agent; and a flexible patch configured to contain, and provide on-demand dispensing of, the agent via compression of the patch in a thickness direction thereof. The patch comprises: an adhesive layer configured to removably couple the patch to a surface, the adhesive layer defining an inner face of the patch; at least one reservoir layer that is configured to absorb and retain the agent therein, the at least one reservoir layer overlying the adhesive layer in the thickness direction; at least one dispenser layer overlying the at least one reservoir layer in thickness direction comprising a plurality of solid portions and an array of a plurality of openings extending through a thickness thereof, the at least one dispenser layer configured to inhibit evaporation of the agent, and control a flow of the agent from the at least one reservoir layer upon the compression of the patch in the thickness direction, when the agent is contained within the at least one reservoir layer; and at least one backer layer positioned between the adhesive layer and the at least one reservoir layer in the thickness direction, the at least one backer layer being substantially impervious to the agent. The solid portions of the at least one dispenser layer and portions of the at least one reservoir layer underlying the plurality of openings of the at least one dispenser layer define outer face of the patch. The at least one reservoir layer is void of the agent absorbed therein.

(14) In some embodiments, the adhesive is a biocompatible adhesive. In some embodiments, the patch further comprises an inner protective film layer extending over and removably coupled to the adhesive layer. In some embodiments, the patch further comprises an outer protective film layer extending over and removably coupled to the outer face of the patch. In some embodiments, the patch further comprises a mechanical connector configured to removably attach the patch to an object.

(15) In some embodiments, the agent is a disinfectant. In some such embodiments, the disinfectant is a biocompatible disinfectant. In some embodiments, the disinfectant comprises ethyl, isopropyl, ethanol (ethyl alcohol), triclosan, triclocarban, benzalkonium chloride, benzethonium chloride or a combination thereof. In some embodiments, the disinfectant comprises ethanol (ethyl alcohol). In some embodiments, the disinfectant comprises a dynamic viscosity within the range of about 4 (Pa.Math.s)(m²/s) and about 15 (Pa.Math.s)(m²/s) at 20 degrees Celsius.

(16) In some embodiments, the agent comprises a medicant or vitamin. In some embodiments, the agent comprises an insecticide. In some embodiments, the agent comprises a fragrance. In some embodiments, the agent comprises a food product. In some embodiments, the agent comprises a cleaning product. In some embodiments, the agent comprises a paint. In some embodiments, the agent comprises an oil.

(17) In some embodiments, the at least one backer layer is substantially impervious to the agent and to air. In some embodiments, the at least one backer layer comprises a solid sheet of material. In some embodiments, the at least one backer layer comprises a polymer layer. In some embodiments, the at least one backer layer comprises at least one polyethylene layer, polypropylene layer, styrene layer, polyetheretherketone layer, acrylic layer, polyvinyl chloride layer, polyurethane layer, Teflon (Polytetrafluoroethylene) layer, syrlin layer or a combination thereof.

(18) In some embodiments, the at least one dispenser layer comprises a sheet of material that is impervious to the agent. In some embodiments, the at least one dispenser layer comprises a sheet of material that is impervious to air. In some embodiments, the at least one dispenser layer comprises a polymer layer. In some embodiments, the at least one dispenser layer comprises at least one polyethylene layer, polypropylene layer, styrene layer, polyetheretherketone layer, acrylic layer, polyvinyl chloride layer, polyurethane layer, Teflon (Polytetrafluoroethylene) layer, syrlin layer or a combination thereof. In some embodiments, the solid portions of the at least one dispenser layer comprise within the range of about 10% and about 65% of the total area of the outer face. In some embodiments, the plurality of openings of the at least one dispenser layer comprise an average total area within the range of about 50 mm.sup.2 and about 300 mm.sup.2 at the outer face. In some embodiments, each of the plurality of openings of the at least one dispenser layer comprise a total area within the range of about 0.05 mm.sup.2 and about 0.3 mm.sup.2 at the outer face.

(19) In some embodiments, the at least one reservoir layer comprises one or more layers of a fabric, Gore-Tex, gauze, an absorbing gel, a polymer, paper, a foam or a combination thereof. In some embodiments, the at least one reservoir layer comprises one or more layers of polymer fibers, cotton fibers, silicone fibers, hydrogel or a combination thereof. In some embodiments, the at least one reservoir layer comprises a fabric layer of non-woven polymer fibers. In some embodiments, the at least one reservoir layer comprises a layer of non-woven polyethylene and/or polypropylene fibers. In some embodiments, the at least one reservoir layer comprises a natural or synthetic non-woven fabric layer. In some embodiments, the at least one reservoir layer is configured to absorb and retain within the range of about 2 grams and about 50 grams of the agent. In some embodiments, the at least one reservoir layer comprises a detached agent capacity within the range of about 1,000 g/mm.sup.2 and about 2,500 g/mm.sup.2. In some embodiments, the at least one reservoir layer comprises an agent absorbency rate of at least 5 g/sec for at least the first 5 seconds of water contact. In some embodiments, when the agent is contained within the at least one reservoir layer, the patch is configured such that a compressive force acting in the thickness direction and applied to the outer surface thereof of at least 1 gram/mm.sup.2 causes the agent to flow through the plurality of apertures and onto the outer face and/or an object at the outer face.

(20) In some embodiments, the, when the agent is contained within the at least one reservoir layer, the patch is configured such that no more than 5 grams of the agent evaporates over 1.5 hours in an ambient environment of non-moving air at 20 degrees Celsius.

(21) In some embodiments, the patch comprises a total thickness within the range of about 0.05

mm and about 3 mm. In some embodiments, an inner portion of the patch defines a first maximum thickness, and a peripheral edge portion of the patch extending about the inner portion and defining an outer extent of the patch defines a second thickness that is less than the first thickness. In some embodiments, a peripheral edge portion of the patch defining an outer extent of the patch comprises the at least one reservoir layer, the at least one dispenser layer and the at least one backer layer being bonded together. In some embodiments, the at least one reservoir layer, the at least one dispenser layer and the at least one backer layer are heat, radio-frequency or ultrasonic welded together at the peripheral edge portion of the patch.

(22) In some embodiments, the adhesive comprises a biocompatible adhesive. In some embodiments, the adhesive layer on the outer side of the front face comprises an acrylic-based pressure-sensitive adhesive. In some embodiments, the adhesive layer comprises an adhesive and scrim layer construct.

(23) In some embodiments, the container is separate and distinct from the flexible patch. In some embodiments, the container is integrated within, or coupled to, the flexible patch. In some embodiments, the volume of the agent is contained within a manually breakable shell or envelope. In some embodiments, the shell or envelope is contained within the flexible patch, or positioned adjacent to the at least one dispenser layer of the flexible patch.

(24) In another aspect, the present disclosure provides an on-demand agent dispensing pocket device. The device comprises: a flexible agent-impervious pocket comprising a front face, a back face, a bottom portion, a top portion, lateral side portions and an interior cavity between inner sides of the front and back faces, wherein the interior cavity is closed at the bottom and lateral side portions and open or openable at the top portion, and wherein the impervious pocket is impervious to a liquid or gelatinous agent; and at least one reservoir dispenser layer positioned within the interior cavity of the pocket that is configured to absorb and retain a liquid or gelatinous agent therein, and control a flow of the agent from the at least one reservoir layer upon compression of the at least one reservoir layer when the agent is retained therein.

(25) In some embodiments, the device further comprises an attachment mechanism on the outer side of the back face that is configured to couple the device to an object. In some embodiments, the attachment mechanism is configured to removably couple the device to an object. In some embodiments, the attachment mechanism comprises a clip or flap member that extends from the back face.

(26) In some embodiments, the attachment mechanism comprises an adhesive layer overlying at least a portion of the outer side of the back face configured to removably couple the device to a surface. In some embodiments, the adhesive layer comprises a biocompatible adhesive. In some embodiments, the adhesive layer comprises an acrylic-based pressure-sensitive adhesive. In some embodiments, the adhesive layer comprises an adhesive and scrim layer construct that is coupled to the outer side of the back face via the adhesive. In some embodiments, the device further comprises a removable back liner layer extending over the adhesive layer to temporarily cover the adhesive layer.

(27) In some embodiments, the device further comprises an attachment mechanism on the outer side of the front face that is configured to couple the device to an object. In some embodiments, the attachment mechanism on the outer side of the front face is configured to removably couple the device to an object. In some embodiments, the attachment mechanism on the outer side of the front face comprises a clip or flap member that extends from the back face.

(28) In some embodiments, the attachment mechanism on the outer side of the front face comprises an adhesive layer overlying at least a portion of the outer side configured to removably couple the device to a surface. In some embodiments, the adhesive layer on the outer side of the front face comprises a biocompatible adhesive. In some embodiments, the adhesive layer on the outer side of the front face comprises an acrylic-based pressure-sensitive adhesive. In some embodiments, the adhesive layer on the outer side of the front face comprises an adhesive and scrim layer construct

that is coupled to the outer side of the front face via the adhesive. In some embodiments, the device further comprises a removable front liner layer extending over the adhesive layer to temporarily cover the adhesive layer on the outer side of the front face.

(29) In some embodiments, the at least one reservoir layer contains a volume of the agent absorbed and retained therein. In some embodiments, the at least one reservoir layer is void of the agent, and wherein the device further comprises container of the agent for selectively applying the agent to an inner side of the at least one reservoir layer. In some embodiments, when the agent is contained within the at least one reservoir layer, the device is configured such that no more than 5 grams of the agent evaporates over 1.5 hours in an ambient environment of non-moving air at 20 degrees Celsius.

(30) In some embodiments, the agent comprises a sanitizing disinfectant. In some embodiments, the disinfectant is a biocompatible disinfectant. In some embodiments, the disinfectant comprises ethyl, isopropyl, ethanol (ethyl alcohol), triclosan, triclocarban, benzalkonium chloride, benzethonium chloride or a combination thereof. In some embodiments, the disinfectant comprises ethanol (ethyl alcohol).

(31) In some embodiments, the agent comprises a medicant or vitamin. In some embodiments, the agent comprises an insecticide. In some embodiments, the agent comprises a fragrance. In some embodiments, the agent comprises a food product. In some embodiments, the agent comprises a cleaning product. In some embodiments, the agent comprises a paint. In some embodiments, the agent comprises an oil. In some embodiments, the agent comprises a dynamic viscosity within the range of about 4 (Pa.Math.s)(m²/s) and about 15 (Pa.Math.s)(m²/s) at 20 degrees Celsius.

(32) In some embodiments, the least one reservoir dispenser layer comprises at least one dispenser layer comprising a plurality of solid portions and an array of a plurality of openings extending through a thickness thereof, the at least one dispenser layer configured to inhibit evaporation of the agent, and control a flow of the agent from the least one reservoir dispenser layer upon the compression of the least one reservoir dispenser layer in a thickness direction when the agent is contained within the least one reservoir dispenser layer.

(33) In some embodiments, the at least one dispenser layer defines an inner most surface of the least one reservoir dispenser layer and is exposed to the internal cavity. In some embodiments, the at least one dispenser layer comprises a sheet of material that is impervious to the agent. In some embodiments, the at least one dispenser layer comprises a sheet of material that is impervious to air. In some embodiments, the at least one dispenser layer comprises a polymer layer. In some embodiments, the at least one dispenser layer comprises at least one polyethylene layer, polypropylene layer, styrene layer, polyetheretherketone layer, acrylic layer, polyvinyl chloride layer, polyurethane layer, Teflon (Polytetrafluoroethylene) layer, syrllyn layer or a combination thereof. In some embodiments, the solid portions of the at least one dispenser layer comprise within the range of about 10% and about 65% of the total area of the outer face. In some embodiments, the plurality of openings of the at least one dispenser layer comprise an average total area within the range of about 50 mm.sup.2 and about 300 mm.sup.2 at the outer face. In some embodiments, each of the plurality of openings of the at least one dispenser layer comprise a total area within the range of about 0.05 mm.sup.2 and about 0.3 mm.sup.2 at the outer face.

(34) In some embodiments, the least one reservoir dispenser layer comprises at least one reservoir layer that is configured to absorb and retain the agent therein. In some embodiments, the at least one reservoir layer underlies the at least one dispenser layer.

(35) In some embodiments, the at least one reservoir layer comprises one or more layers of a fabric, Gore-Tex, gauze, an absorbing gel, a polymer, paper, a foam or a combination thereof. In some embodiments, the at least one reservoir layer comprises one or more layers of polymer fibers, cotton fibers, silicone fibers, hydrogel or a combination thereof. In some embodiments, the at least one reservoir layer comprises a fabric layer of non-woven polymer fibers. In some embodiments, the at least one reservoir layer comprises a layer of non-woven polyethylene and/or polypropylene

fibers. In some embodiments, the at least one reservoir layer comprises a natural or synthetic non-woven fabric layer.

(36) In some embodiments, the at least one reservoir layer is configured to absorb and retain within the range of about 2 grams and about 50 grams of the agent. In some embodiments, the at least one reservoir layer comprises a detached agent capacity within the range of about 1,000 g/mm.^{sup.2} and about 2,500 g/mm.^{sup.2}. In some embodiments, the at least one reservoir layer comprises an agent absorbency rate of at least 5 g/sec for at least the first 5 seconds of water contact. In some embodiments, the at least one reservoir dispenser layer is configured such that a compressive force acting in the thickness direction and applied to an exposed inner surface thereof of at least 1 gram/mm.^{sup.2} causes the agent to flow therefrom and onto the exposed inner surface.

(37) In some embodiments, the least one reservoir dispenser layer comprises at least one backer layer underlying at least one reservoir layer, the at least one backer layer being substantially impervious to the agent. In some embodiments, the at least one backer layer is substantially impervious to the agent and to air. In some embodiments, the at least one backer layer comprises a solid sheet of material. In some embodiments, the at least one backer layer comprises a polymer layer. In some embodiments, the at least one backer layer comprises at least one polyethylene layer, polypropylene layer, styrene layer, polyetheretherketone layer, acrylic layer, polyvinyl chloride layer, polyurethane layer, Teflon (Polytetrafluoroethylene) layer, syrlin layer or a combination thereof.

(38) In some embodiments, the front face and/or the back face of the pocket is substantially impervious to the agent. In some embodiments, the front face and/or the back face of the pocket is substantially impervious to the agent and to air. In some embodiments, the front face and/or the back face of the pocket comprises a solid sheet of material. In some embodiments, the front face and/or the back face of the pocket comprises a polymer layer. In some embodiments, the front face and/or the back face of the pocket comprises at least one polyethylene layer, polypropylene layer, styrene layer, polyetheretherketone layer, acrylic layer, polyvinyl chloride layer, polyurethane layer, Teflon (Polytetrafluoroethylene) layer, syrlin layer or a combination thereof.

(39) In some embodiments, the at least one reservoir dispenser layer comprises a total thickness within the range of about 0.05 mm and about 3 mm. In some embodiments, an inner portion of the at least one reservoir dispenser layer defines a first maximum thickness, and a peripheral edge portion of the at least one reservoir dispenser layer extending about the inner portion and defining an outer extent of the at least one reservoir dispenser layer defines a second thickness that is less than the first thickness.

(40) In some embodiments, the at least one reservoir dispenser layer comprises at least one dispenser layer and at least one reservoir layer bonded together. In some embodiments, the at least one dispenser layer overlies the at least one reservoir layer, and the at least one reservoir layer is bonded to the inner face or outer face. In some embodiments, the at least one reservoir layer, the at least one dispenser layer and the inner face or outer face are heat, radio-frequency or ultrasonic welded together at the peripheral edge portion of the patch. In some embodiments, the at least one reservoir dispenser layer comprises a plurality of sublayers coupled together.

(41) In some embodiments, further comprising a volume of the agent. In some embodiments, the volume of the agent is absorbed within the at least one reservoir dispenser layer. In some embodiments, the volume of the agent is contained within a manually breakable shell or envelope. In some embodiments, the shell or envelope is contained within, or positioned to, the at least one reservoir dispenser layer. In some embodiments, the device is configured as an on-demand agent dispensing pocket patch.

(42) It should be appreciated that all combinations of the foregoing concepts and additional concepts discussed in greater detail below (provided such concepts are not mutually inconsistent) are contemplated as being part of the inventive subject matter disclosed herein and may be used to achieve the benefits and advantages described herein.

(43) These and other objects, features and advantages of this disclosure will become apparent from the following detailed description of the various aspects of the disclosure taken in conjunction with the accompanying drawings.

(44) In another aspect, the present disclosure provides a dispensing device comprising: an attachment portion comprising an attachment surface that is configured to removably affix the device to an object; and a reservoir and dispenser portion coupled to and overlying at least a portion of the attachment portion, the reservoir and dispenser portion containing a volume of an agent and configured to control a dispense rate of the agent to a user at an exposed outer dispenser surface portion thereof when the user touches the outer surface portion.

(45) In some embodiments, the attachment portion is configured to directly removably attach to skin of a user. In some embodiments, the attachment portion comprises a biocompatible adhesive layer that forms the attachment surface. In some embodiments, the biocompatible adhesive comprises a biocompatible pressure sensitive adhesive. In some embodiments, the attachment portion further comprises a removably protective film extending over the biocompatible adhesive.

(46) In some embodiments, the attachment portion is configured to removably attach to an inanimate object. In some embodiments, the attachment portion comprises an adhesive and/or at least mechanical connector configured to removably attach to the inanimate object and that forms the attachment surface.

(47) In some embodiments, the attachment portion comprises a carrier layer. In some embodiments, the carrier layer comprises at least one layer comprises of a fabric, plastic or latex, and wherein the attachment surface is formed by an attachment mechanism coupled to the carrier layer. In some embodiments, the carrier layer comprises a water absorbable and/or air permeable fabric layer. In some embodiments, the fabric layer comprises a woven nylon layer, a woven polyester layer, Gore-Tex layer or a combination thereof.

(48) In some embodiments, the attachment portion and the reservoir and dispenser portion are flexible. In some embodiments, the reservoir and dispenser portion comprises a single layer. In some embodiments, the reservoir and dispenser portion comprises at least one reservoir layer or portion that contains the volume of the agent and at least one dispenser layer or portion that forms the outer dispenser surface portion, the at least one reservoir layer or portion and the at least one dispenser layer or portion being separate and distinct from each other. In some embodiments, the reservoir and dispenser portion comprises a waterproof layer.

(49) In some embodiments, the volume of the agent is absorbed into the reservoir and dispenser portion. In some embodiments, the reservoir and dispenser portion defines at least one inner cavity that contains the volume of the agent. In some embodiments, the volume of the agent comprises a plurality of distinct agent portions distributed within the reservoir and dispenser portion. In some embodiments, the plurality of distinct agent portions comprise capsulated agent portions.

(50) In some embodiments, the reservoir and dispenser portion comprises one or more layers of a fabric, Gore-Tex, gauze, absorbing gel, plastic, paper, foam or a combination thereof. In some embodiments, the reservoir and dispenser portion comprises one or more fabric layers formed of cotton, nylon, polyester or a combination thereof.

(51) In some embodiments, the reservoir and dispenser portion comprises a plurality of selectively removably attached stacked layers each with an upper surface that forms the outer dispenser surface portion when positioned as the uppermost layer. In some embodiments, a pore/perforation size, pore/perforation arrangement, density, thickness, and capillary action of the reservoir and dispenser portion is configured to control the amount of the agent that travels through the reservoir and dispenser portion and to outer dispenser surface portion.

(52) In some embodiments, the agent is a liquid and/or gel. In some embodiments, the agent is solid.

(53) In some embodiments, the agent is a disinfectant. In some embodiments, the disinfectant is a biocompatible disinfectant. In some embodiments, the disinfectant comprises ethyl, isopropyl,

ethanol (ethyl alcohol), triclosan, triclocarban, benzalkonium chloride, benzethonium chloride or a combination thereof. In some embodiments, the disinfectant comprises ethanol (ethyl alcohol). In some embodiments, the agent comprises an essential oil. In some embodiments, the agent comprises a medicant or vitamin. In some embodiments, the agent comprises an insecticide. In some embodiments, the agent comprises a fragrance. In some embodiments, the agent comprises a food product. In some embodiments, the agent comprises a cleaning product. In some embodiments, the agent comprises a paint.

(54) In some embodiments, the device further comprises a cover layer overlying the outer dispenser surface portion and removably attached thereto. In some embodiments, an outer dispenser surface portion of the cover layer comprises a visual and/or tactile indication and/or is configured to display a visual indication. In some embodiments, the device further comprises a backer layer overlying the attachment portion and removably attached thereto. In some embodiments, the outer dispenser surface portion of the cover layer comprises at least one of a visible light reflective material or an illumination device thereon.

(55) In some embodiments, the reservoir and dispenser portion is configured to change color between at least two differing total volumes of the agent contained therein. In some embodiments, the reservoir and dispenser portion comprises a plurality of removably coupled overlying reservoir and dispenser layers that each contain a volume of the agent, and wherein the upper most reservoir and dispenser layer forms the outer dispenser surface portion. In some embodiments, the reservoir and dispenser portion comprises at least one reservoir area and at least one dispensing area that is spaced from the at least one reservoir area, and wherein the at least one dispensing area forms the outer dispenser surface portion. In some embodiments, the at least one reservoir area comprises a compressible internal cavity that contains the volume of the agent and at least one channel that defines a pathway for the flow of the agent from the internal cavity to the at least one dispensing area.

(56) In some embodiments, the device is elongated and rolled upon itself into a spiral form.

(57) In some embodiments, the device comprises a pocket with an internal cavity, and the reservoir and dispenser portion is positioned within the internal cavity of the pocket. In some embodiments, the attachment portion comprises a backside of the internal cavity of the pocket.

(58) In another aspect, the present disclosure provides a method of disinfecting a surface. The method comprises obtaining any of the devices discussed, wherein the agent of the device comprises a topical disinfectant; removably affixing the attachment portion of the device to an object; and transferring a portion of the disinfectant from the device via the outer dispenser surface portion to the surface.

(59) In some embodiments, the transferring the portion of the disinfectant from the device to the surface comprises engaging the outer dispenser surface portion and the surface. In some embodiments, the transferring the portion of the disinfectant from the device to the surface comprises manually touching the outer dispenser surface portion to dispense the portion of the disinfectant, and manually transferring at least some of the dispensed portion of the disinfectant to the surface.

(60) In another aspect, the present disclosure provides a disinfectant construct comprising a flexible and porous polymer member comprising internal voids in communication with an outer dispenser surface portion, and a disinfectant contained within the internal voids of the member.

(61) In some embodiments, the disinfectant is naturally drawn to the outer dispenser surface portion from within the internal voids due to capillary action. In some embodiments, the polymer member comprises silicone, polyurethane, hydrogel or a combination thereof. In some embodiments, the disinfectant is a liquid and/or gel biocompatible disinfectant.

(62) In some embodiments, the member is thin and elongated. In some embodiments, the member is arranged in a rolled arrangement.

(63) In some embodiments, the construct further comprises an adhesive or attachment mechanism

coupled to a backside of the member. In some embodiments, the adhesive or attachment mechanism is configured affix the member to an outer surface of an object.

(64) It should be appreciated that all combinations of the foregoing concepts and additional concepts discussed in greater detail below (provided such concepts are not mutually inconsistent) are contemplated as being part of the inventive subject matter disclosed herein and may be used to achieve the benefits and advantages described herein.

(65) These and other objects, features and advantages of this disclosure will become apparent from the following detailed description of the various aspects of the disclosure taken in conjunction with the accompanying drawings.

Description

BRIEF DESCRIPTION OF THE DRAWINGS

(1) These and other features, aspects, and advantages of the present disclosure will become better understood when the following detailed description is read with reference to the accompanying drawings. It should be understood that at least some of the drawings are not necessarily to scale (but at least some of the drawings may be drawn to scale). In certain figures, details that are not necessary for an understanding of the disclosure or that render other details difficult to perceive may have been omitted. It should be understood, of course, that the disclosure is not necessarily limited to the particular embodiments illustrated in the figures. Like reference numerals are utilized throughout the figures to represent like aspects illustrated in the drawings, wherein:

(2) FIG. 1 illustrates a top view of an on-demand disinfectant dispensing device according to one embodiment of the present disclosure.

(3) FIG. 2 illustrates a side cross-sectional view of the on-demand disinfectant dispensing device of FIG. 1 according to one embodiment of the present disclosure.

(4) FIG. 3 illustrates a front view of the on-demand disinfectant dispensing device of FIG. 1 removably affixed to an inanimate object worn by a user according to one embodiment of the present disclosure.

(5) FIG. 4 illustrates a top view of the on-demand disinfectant dispensing device of FIG. 1 removably affixed to a passive skin area of a user according to one embodiment of the present disclosure.

(6) FIGS. 5A-5M illustrates varying views of an on-demand disinfectant dispensing device according to FIG. 1 removably affixed to active skin areas of a user according to one embodiment of the present disclosure.

(7) FIGS. 6A and 6B illustrate perspective top and bottom views, respectively, a side cross-sectional view of the on-demand disinfectant dispensing device of FIG. 1 including seal and backing layers according to one embodiment of the present disclosure.

(8) FIG. 7 illustrates a top view of the on-demand disinfectant dispensing device of FIG. 1 as the volume or availability of disinfectant therein lowers over a period of time according to one embodiment of the present disclosure.

(9) FIG. 8 illustrates a side cross-sectional view of an on-demand disinfectant dispensing device with a disinfectant release top layer according to one embodiment of the present disclosure.

(10) FIG. 9 illustrates a side cross-sectional view of an on-demand disinfectant dispensing device with embedded discrete disinfectant volumes according to one embodiment of the present disclosure.

(11) FIG. 10 illustrates a perspective view of the on-demand disinfectant dispensing device of FIG. 9 affixed to a user's hand and the user causing some of the embedded discrete disinfectant volumes to be dispensed according to one embodiment of the present disclosure.

(12) FIG. 11 illustrates a side cross-sectional view of an on-demand disinfectant dispensing device

with a plurality of removable disinfectant reservoir and dispensing layers according to one embodiment of the present disclosure.

(13) FIG. 12 illustrates a top view of an on-demand disinfectant dispensing device with a disinfectant reservoir area and at least one disinfectant dispensing area according to one embodiment of the present disclosure.

(14) FIG. 13 illustrates a top view of an on-demand disinfectant dispensing device with a disinfectant reservoir and pump area, at least one disinfectant dispensing area and at least one defined flowpath for the flow of disinfectant from the disinfectant reservoir and pump area to the at least one disinfectant dispensing area according to one embodiment of the present disclosure.

(15) FIG. 14 illustrates a side cross-sectional view of the on-demand disinfectant dispensing device of FIG. 13 extending through a defined disinfectant flowpath according to one embodiment of the present disclosure.

(16) FIG. 15 illustrates a side cross-sectional view of the on-demand disinfectant dispensing device of FIG. 13 offset from the at least one defined disinfectant flowpath according to one embodiment of the present disclosure.

(17) FIG. 16 illustrates a top view of an on-demand disinfectant dispensing device configured to be applied to a user's hand according to one embodiment of the present disclosure.

(18) FIG. 17 illustrates a top view of another on-demand disinfectant dispensing device configured to be applied to a user's hand according to one embodiment of the present disclosure.

(19) FIG. 18 illustrates a perspective view of an elongated on-demand delivery device configured to in a roll form according to one embodiment of the present disclosure.

(20) FIG. 19 illustrates an elevational perspective view of an on-demand delivery device configured in a pocket form according to one embodiment of the present disclosure.

(21) FIG. 20 illustrates a pocket-form on-demand delivery device incorporated into a piece of clothing according to one embodiment of the present disclosure.

(22) FIG. 21 illustrates a cross-sectional view of the on-demand delivery device of FIG. 20 according to one embodiment of the present disclosure.

(23) FIG. 22 illustrates a cross-sectional view of another pocket-form on-demand delivery device according to one embodiment of the present disclosure.

(24) FIG. 23 illustrates a top perspective partial-exploded view of an on-demand agent dispensing patch according to one embodiment of the present disclosure.

(25) FIG. 24 illustrates a top perspective exploded view of an on-demand agent dispensing patch according to one embodiment of the present disclosure.

(26) FIG. 25 illustrates another top perspective exploded view of an on-demand agent dispensing patch according to one embodiment of the present disclosure.

(27) FIG. 26 illustrates a top perspective view of an on-demand agent dispensing patch according to one embodiment of the present disclosure.

(28) FIG. 27 illustrates a top view of the on-demand agent dispensing patch of FIG. 26 according to one embodiment of the present disclosure.

(29) FIG. 28 illustrates a side view of the on-demand agent dispensing patch of FIG. 26 according to one embodiment of the present disclosure.

(30) FIG. 29 illustrates a plurality of the on-demand agent dispensing patch of FIG. 26 provided on a support member according to one embodiment of the present disclosure.

(31) FIG. 30 illustrates a top perspective view of a kit comprising a plurality of on-demand agent dispensing patches and a container of a volume of an agent according to one embodiment of the present disclosure.

(32) FIG. 31 illustrates a top perspective view of the application of the agent of the container of the kit of FIG. 8 on an on-demand agent dispensing patch of the kit of FIG. 30 coupled to a user according to one embodiment of the present disclosure.

(33) FIG. 32 illustrates a top perspective view of a user compressing an on-demand agent

dispensing patch to dispense a volume of agent from an on-demand agent dispensing patch according to one embodiment of the present disclosure.

(34) FIG. 33 illustrates another top perspective view of a user compressing an on-demand agent dispensing patch to dispense a volume of agent from an on-demand agent dispensing patch according to one embodiment of the present disclosure.

(35) FIG. 34 illustrates a top perspective view of an on-demand agent dispensing pocket patch according to one embodiment of the present disclosure.

(36) FIG. 35 illustrates another top perspective view of the on-demand agent dispensing pocket patch of FIG. 34 with an adhesive liner layer partially removed according to one embodiment of the present disclosure.

(37) FIG. 36 illustrates a top perspective cross-sectional view of the on-demand agent dispensing pocket patch of FIG. 35 according to one embodiment of the present disclosure.

(38) FIG. 37A illustrates a top perspective view of a user inserting their fingers into the on-demand agent dispensing pocket patch of FIG. 34 according to one embodiment of the present disclosure.

(39) FIG. 37B illustrates a bottom perspective view of the user using the on-demand agent dispensing pocket patch of FIG. 37A to dispense a volume of agent onto their fingers according to one embodiment of the present disclosure.

(40) FIG. 37C illustrates a top perspective view of the user using the on-demand agent dispensing pocket patch of FIG. 37A to dispense a volume of agent onto their fingers according to one embodiment of the present disclosure.

(41) FIG. 38 illustrates a top perspective view of a resealable on-demand agent dispensing pocket patch according to one embodiment of the present disclosure.

DETAILED DESCRIPTION OF THE DRAWINGS

(42) Aspects of the present disclosure and certain examples, features, advantages, and details thereof, are explained more fully below with reference to the non-limiting examples illustrated in the accompanying drawings. Descriptions of well-known components, aspects, materials, chemicals, fabrication mechanisms, processing techniques, uses, etc., are omitted so as not to unnecessarily obscure the relevant details. It should be understood, however, that the detailed description and the specific examples, while indicating aspects of the disclosure, are given by way of illustration only, and are not by way of limitation. Various substitutions, modifications, additions, and/or arrangements, within the spirit and/or scope of the underlying inventive concepts will be apparent to those skilled in the art from this disclosure.

(43) Approximating language, as used herein throughout disclosure, may be applied to modify any quantitative representation that could permissibly vary without resulting in a change in the basic function to which it is related. Accordingly, a value modified by a term or terms, such as “terms “substantially”, “approximately”, “about”, “relatively,” or other such similar terms is not limited to the precise value specified, and is used to describe and account for small fluctuations, such as due to variations in processing, from a reference or parameter. Such small fluctuations include a zero fluctuation from the reference or parameter as well. For example, these terms can refer to less than or equal to $\pm 5\%$, such as less than or equal to $\pm 2\%$, such as less than or equal to $\pm 1\%$, such as less than or equal to $\pm 0.5\%$, such as less than or equal to $\pm 0.2\%$, such as less than or equal to $\pm 0.1\%$, such as less than or equal to $\pm 0.05\%$. In some instances, the approximating language may correspond to the precision of an instrument for measuring the value.

(44) Terminology used herein is for the purpose of describing particular examples only and is not intended to be limiting. As used herein, the singular forms “a”, “an” and “the” are intended to include the plural forms as well, unless the context clearly indicates otherwise. Furthermore, references to “one example” are not intended to be interpreted as excluding the existence of additional examples that also incorporate the recited features. Moreover, unless explicitly stated to the contrary, the terms “comprising” (and any form of “comprise,” such as “comprises” and “comprising”), “have” (and any form of “have,” such as “has” and “having”), “include” (and any

form of “include,” such as “includes” and “including”), and “contain” (and any form of “contain,” such as “contains” and “containing”) are used as open-ended linking verbs. As a result, any examples that “comprises,” “has,” “includes” or “contains” one or more step or element possesses such one or more step or element, but is not limited to possessing only such one or more step or element. As used herein, the terms “may” and “may be” indicate a possibility of an occurrence within a set of circumstances; a possession of a specified property, characteristic or function; and/or qualify another verb by expressing one or more of an ability, capability, or possibility associated with the qualified verb. Accordingly, usage of “may” and “may be” indicates that a modified term is apparently appropriate, capable, or suitable for an indicated capacity, function, or usage, while taking into account that in some circumstances the modified term may sometimes not be appropriate, capable or suitable. For example, in some circumstances, an event or capacity can be expected, while in other circumstances the event or capacity cannot occur—this distinction is captured by the terms “may” and “may be.”

(45) As used herein and unless otherwise indicated, the term “entirety” (and any other form of “entire”) means at least a substantial portion, such as at least 95% or at least 99%. The term “entirety” (and any other form of “entire”), as used herein, is thereby not limited to 100%, unless otherwise indicated.

(46) The terms “disinfecting,” “sanitizing” and “sterilizing” (and the equivalents thereof) are used synonymously herein to refer to the action of trappings, removing, killing, or inhibiting the growth and/or reproduction of a pathogen (i.e., an infectious disease-causing microorganism, such as various viruses, bacteria, fungus, and parasites). Similarly, the terms “disinfectant,” “sanitizer,” “sterilizer,” “antimicrobial” and “antiseptic” (and the equivalents thereof) are used synonymously herein to refer to a substance that disinfects (i.e., that traps, removes, kills, or inhibits the growth and/or reproduction of a pathogen). The term “topical” is used herein to refer to a disinfectant that disinfects pathogens located on (the outside of) one's skin or the outer/exterior surface of an inanimate object).

(47) The terms “affix,” “connect” “contact,” “coupled” and/or the like are broadly defined herein to encompass a variety of divergent arrangements and assembly techniques. These arrangements and techniques include, but are not limited to (1) the direct joining of one component and another component with no intervening components therebetween (i.e., the components are in direct physical contact); and (2) the joining of one component and another component with one or more components therebetween, provided that the one component being “affixed to,” “connected to,” “contacting” or “coupled to” the other component is somehow in operative communication with the other component (notwithstanding the presence of one or more additional components therebetween). It is to be understood that some components that are in direct physical contact with one another may or may not be in fluid contact with one another. Moreover, two components that are fluidly/fluidically connected, fluidly/fluidically coupled or in fluid/fluidic communication may or may not be in direct physical contact, and one or more other components may be positioned therebetween.

(48) The present disclosure provides for on-demand disinfectant dispensing devices, and disinfecting methods utilizing such devices, that can be removably affixed to an object (such as a user or a surface of an inanimate object) that provide easy, available access to a supply of a disinfectant over an extended period of time. The on-demand disinfectant dispensing devices thereby provide for disinfection of a user's body (e.g., the skin of a user's hand), as well as potential transfer of the disinfectant to, and thereby disinfection of, the skin of at least one other person and/or a surface of an inanimate object via touching thereof by the user after use/application of the disinfectant. The efficient (e.g., one step) on-demand disinfectant dispensing devices and methods are thereby able to efficiently provide an on-demand disinfectant (e.g., via single step, for example) to one or more people and/or surfaces.

(49) The on-demand disinfectant dispensing devices provide a simple, cost effective way to reduce

the spread of pathogens/infectious disease. The devices are self-contained, are void of bottles that need to be carried and opened, include a no spill solution, and do not necessitate pouring or spraying for use. As noted above, the on-demand disinfectant dispensing devices may be configured to be removably affixed to a user, such as to the user's skin or the user's clothing (or any other inanimate object carried or worn by the user). In such a configuration, the on-demand disinfectant dispensing device provides a no fuss anti-bacterial action wearable device. The on-demand disinfectant dispensing wearable devices may be configured to be removably affixed to an active point/portion of contact of the user that would benefit from being disinfected, such as on the inside of a user's hand (e.g., on the palm and/or fingers), to target one or more locations on one's body for an added level of protection and peace of mind. In this way, the active on-demand disinfectant dispensing wearable device can be applied over the active portion of the user (e.g., a user's elbow, palm, finger, etc.) and replace the portion with a disinfectant dispensing surface and thereby a disinfected/sterile surface.

(50) In some other embodiments, the on-demand disinfectant dispensing wearable device may be configured to be removably affixed to a passive portion of the user's skin (or an object worn/carried by the user) (or on an inanimate object remote from the user) that is spaced from the point/portion of contact of the user, to allow for selective application of the disinfectant on the portion of contact of the user by passing the portion of contact of the user on/over the device. For example, a passive on-demand disinfectant dispensing wearable device may be removably affixed to the back of a user's hand or forearm, or on their clothing, and the user may wipe their finger(s)/hand on/over the exposed dispensing surface of the device to apply the disinfectant thereto (and thereby disinfect their finger(s)/hand). In such a passive disinfecting embodiment, the on-demand disinfectant dispensing wearable device provides quick and discrete on-demand access to a disinfectant where swiping/contacting the device disinfects a person's point/portion of contact (e.g., their hand(s) or other skin surface).

(51) The on-demand disinfectant dispensing devices disclosed herein can thereby be applied to an active or passive surface portion of a user (or an object) to disinfect it, and, potentially, pass it on to a third party that subsequently touches the surface portion (i.e., pays it forward). In this way, the on-demand disinfectant dispensing devices can provide a level of disinfecting of safety to a user, with the additional benefit of protecting others that may touch the user or even a common surface/object. Communal touchpoints can thus be sanitized and provide an integral part to the health and wellbeing of a community as a whole via the disclosed on-demand disinfectant dispensing devices.

(52) As shown in FIGS. 1-6, in some embodiments a disinfectant dispensing device **10** according to the present disclosure includes an attachment portion **12** and a disinfectant reservoir and dispenser portion **16**

(53) The attachment portion **12** may comprise an attachment surface **17** that is configured to affix/couple the device **10** to an object (removably or fixedly) (e.g., a user skin or a surface of an inanimate object, as described above and further below). The disinfectant reservoir and dispenser portion **14** is coupled to and overlies at least a portion of the attachment portion, as shown in FIGS. 1-6. As also shown in FIGS. 1-6, the disinfectant reservoir and dispenser portion **14** contains a volume of disinfectant **20**. The disinfectant reservoir and dispenser portion **14** is configured to control a dispense rate (i.e., time release) of the volume of topical disinfectant **20** to a user at an exposed outer dispensing surface portion **16** thereof when a user touches the outer dispensing surface portion **16**. In some embodiments, the disinfectant reservoir and dispenser portion **14** may be refillable.

(54) The device **10** (e.g., the attachment portion **12** and the disinfectant reservoir and dispenser portion **14**) may be of any size and any shape. In some embodiments, the device may be relatively flat or thin in a thickness direction (e.g., comprise a patch, sheet or like arrangement). In some embodiments, the size and/or shape of the device **10** may correspond to a particular surface/object

to which is can be removably coupled to. In this way, the device **10** may be configured to a particular usage (e.g., shaped and sized to removably attach to a particular object or body portion of a user). The device **10** (e.g., the attachment portion **12** and the disinfectant reservoir and dispenser portion **14**) may be relatively flexible, such as easily manually flexible.

(55) As shown in FIGS. **2** and **6**, the attachment portion **12** may define the backside or underside of the device **10**, and include a backside attachment surface **17** that is configured to abut or overly another surface when the device **10** is coupled thereto. In some embodiments, the attachment portion **12** may include an adhesive on (or that forms) the attachment surface **17** that is configured to removably couple the device **10** to a surface. In some other embodiments (not shown), the attachment portion **12** may include a mechanical mechanism to removably attach the device to a surface. For example, the attachment portion **12** may include and/or comprise a strap, hook-and-loop (or hook-and-hook) fastener, snap fastener, button, strap, elastic, suction cup/member, zipper, threaded post/aperture, magnet or any other fastener mechanism that is configured to removably couple the device **10** to another surface/object. It is noted that the particular design and configuration can of the attachment portion **12** can take on any form with respect to a particular surface/object sufficient to removable couple the device **10** to the surface/object.

(56) In some embodiments, the attachment portion **12** may include an adhesive on (or that forms) the attachment surface **17** that is configured to removably couple the device **10** to an inanimate object and/or skin of a user. In some such embodiments, the adhesive may comprise a pressure sensitive adhesive (PSA). In some such embodiments, the attachment portion **12** may be configured to directly removably attach to skin of a user via a biocompatible (and/or medical grade) adhesive, such as a biocompatible PSA, and/or an alcohol resistant adhesive. In some embodiments, the adhesive of the attachment portion **12** may comprise an acrylic adhesive, an epoxy adhesive, a styrene block co-polymer adhesive or a combination thereof. In some such embodiments, the adhesive of the attachment portion **12** may comprise an acrylate, such as methacrylates, epoxy diacrylates (i.e., a vinyl resin) or a combination thereof. In some such embodiments, the adhesive of the attachment portion **12** may comprise spirit gum (mastic), matte spirit gum, liquid latex, thickened latex, flexible collodion or a combination thereof. In some such embodiments, the adhesive may comprise a biodegradable, natural and/or organic adhesive. In some embodiments, the tack, adhesion, shear strength and breathability of the adhesive may be configured such that the device **10** is biocompatible with respect to a user's skin.

(57) As shown in FIGS. **6A** and **6B**, in some embodiments, the attachment portion **12** of the device **10** may comprise an adhesive and a removable attachment protective film **26** extending over the attachment surface **17** of the adhesive. The attachment protective film **26** may be configured to cover and protect the adhesive prior to use (or when otherwise not in use). The attachment protective film **26** may thereby be configured to be removable from the adhesive (e.g., peeled off) such that the adhesive remains coupled to the device **10** and is effective in coupling the device **10** to a surface. In some embodiments, the attachment protective film **26** may comprise a plastic/polymer, coated paper, metallic/metalized layer (e.g., a foil layer or aluminized material layer) or a combination thereof. As also shown in FIGS. **6A** and **6B**, in some embodiment the protective film **26** may include a tab **25** to aide in manually removing (e.g., peeling) the protective film **26** from the attachment surface **17**.

(58) In some embodiments, the attachment portion **12** may include at least one carrier or support layer. The carrier layer may support the attachment mechanism (e.g., an adhesive and/or mechanical fastener) (i.e., the attachment mechanism may be coupled to bottom side of the carrier layer). Further, the disinfectant reservoir and dispenser portion **14** may be coupled to and overly (e.g., directly overly) the top side of the carrier layer. In some embodiments, the carrier layer comprises at least one layer of a fabric (woven or non-woven), plastic or latex. For example, the carrier layer may comprise a breathable fabric, such as a woven (or non-woven) nylon, polyester or Gore-Tex layer. The carrier layer may be flexible, and may comprise a water absorbable and/or air

permeable fabric layer (particularly in embodiments of the device **10** for use directly on the skin of a user, as described further below).

(59) As also shown in FIGS. **6A** and **6B**, the disinfectant reservoir and dispenser portion **14** of the device **10** may include a dispenser protective film **24** extending over the dispensing surface portion **16**. The dispenser protective film **24** may be configured to cover and protect the dispensing surface portion **16**, and thereby the volume of disinfectant **20** contained within the disinfectant reservoir and dispenser portion **14**, prior to use (or when otherwise not in use). For example, the dispenser protective film **24** may be effective in preventing (or at least substantially inhibiting) evaporation and/or leakage of the disinfectant **20** from the disinfectant reservoir and dispenser portion **14** via the dispensing surface portion **16**. The dispenser protective film **24** may thereby be configured to be removable from the dispensing surface portion **16** (e.g., peeled off) such that the disinfectant **20** is able to be dispensed/flow through the dispensing surface portion **16**. In some embodiments, the dispenser protective film **24** may comprise a plastic/polymer or metallic/metalized layer (and potentially an adhesive). Removal of the dispenser protective film **24** may thereby activate the device **10**/disinfectant reservoir and dispenser portion **14** for use (e.g., begin or initiate wicking and/or capillary action of the disinfectant **20** and/or evaporation of the disinfectant **20** at the exposed dispensing surface portion **16**).

(60) In some embodiments, the outer surface of the cover or protective film **24** may include a visual and/or tactile indication (not shown), or be configured such that a visual and/or tactile indication can be drawn or otherwise formed thereon. For example, the outer surface of the protective film **24** may include a logo, name, trademark or other visual indication that may enhance the aesthetic look and/or feel of the device **10**. As another example, the outer surface of the cover or protective film **24** may be configured as a paper, chalkboard or whiteboard type configuration to allow for personalization of the device **10**. In some embodiments, the outer surface of the cover or protective film **24** comprises at least one of a visible light reflective material and an illumination device thereon. As also shown in FIGS. **6A** and **6B**, in some embodiment the protective film **24** may include a tab **25** to aide in manually removing (e.g., peeling) the protective film **24** from the dispensing surface portion **16**.

(61) The disinfectant reservoir and dispenser portion **14** may comprise one or more layers and/or more materials. In some embodiments, as shown in FIGS. **1** and **2**, the disinfectant reservoir and dispenser portion **14** may comprise a single later comprised of one or more materials. In some other embodiments, as discussed further below, the disinfectant reservoir and dispenser portion **14** may comprise one or more disinfectant reservoir layers (or portions) and one or more dispenser layers (or portions) that are separate and distinct from the one or more disinfectant reservoir layers (or portions).

(62) The disinfectant reservoir and dispenser portion **14** is configured to contain the volume of disinfectant **20**. For example, the disinfectant **20** may be absorbed into the disinfectant reservoir and dispenser portion **14** (e.g., the disinfectant reservoir and dispenser portion **14** may comprise an absorbent pad, layer or portion). As another example, the disinfectant reservoir and dispenser portion **14** may form at least one cavity, opening or cell that contains the disinfectant **20**. The disinfectant reservoir and dispenser portion **14** is also configured to dispense the disinfectant **20** at the dispensing surface portion **16** to a user who touches, such as wipes across, the dispensing surface portion **16**. At least a portion of the disinfectant reservoir and dispenser portion **14** thereby automatically controls the speed and duration of the release/flow of the disinfectant at/to the outer dispensing surface portion **16** (and thereby to a user on an on-demand basis). For example, the disinfectant reservoir and dispenser portion **14** may be configured to draw or otherwise provide a portion of the volume of disinfectant **20** at or to the dispensing surface portion **16** such that when a user touches or wipes the dispensing surface portion **16**, some of the disinfectant **20** transfers to the user.

(63) In some embodiments, the reservoir and dispensing functions or processes of the reservoir and

dispensing functions or processes may be accomplished by a common layer or portion of the disinfectant reservoir and dispenser portion **14** may be accomplished by a common layer or portion of the disinfectant reservoir and dispenser portion **14**. In some other embodiments, the reservoir and dispensing functions or processes of the reservoir and dispensing functions or processes may be accomplished by a common layer or portion of the disinfectant reservoir and dispenser portion **14** may be accomplished by differing layers or portions of the disinfectant reservoir and dispenser portion **14**. In some embodiments, the disinfectant reservoir and dispenser portion **14** may comprise at least one layer or portion formed of a (woven or non-woven) cloth or fabric (e.g., a cotton, nylon, polyester or the like layer/portion), Gore-Tex, gauze, absorbing gel (e.g., a hydrogel), flashspun high-density polyethylene (e.g., Tyvek), porous/filter paper, plastic film, foam, hydrocolloid, alginate, polysaccharide pastes, granules and/or beads, or a combination thereof. For example, in some embodiments the reservoir and dispenser portion **14** may comprise one or more layers of cotton, polyester, silicone, polyurethane, polyamide, polyethylene, hydrogel or a combination thereof. In some such embodiments, the reservoir and dispenser portion **14** may include a cotton fabric layer or portion, a nylon fabric layer or portion, a polyester fabric layer or portion, a flashspun high-density polyethylene fiber layer or portion, a hydrogel layer or portion, a flexible polyamide net coated with silicone layer or portion, a hydrogel layer or portion formed of hydrophilic polymers, or a combination thereof.

(64) At least the dispensing portion of the disinfectant reservoir and dispenser portion **14** may be configured to control the amount and/or rate at which the disinfectant **20** moves or is drawn therethrough (e.g., via capillary action) and to the dispensing surface portion **16**. The disinfectant reservoir and dispenser portion **14** is thereby configured to meter/control the release or dispensing of the disinfectant **20** to/from/at the dispensing surface portion **16**. For example, at least one of the pore/perforation size, pore/perforation size count/number, density, thickness, and capillary action of the disinfectant reservoir and dispenser portion **14** may be configured to control the amount and/or rate at which the disinfectant **20** moves or is drawn to and through the dispensing surface portion. The disinfectant reservoir and dispenser portion **14** may be configured such that a particular dosage of the disinfectant **20** flows through the disinfectant reservoir and dispenser portion **14** and the dispensing surface portion **16** when a certain pressure (e.g., a certain magnitude, area, direction, etc.) is applied thereto by a user such that the particular dosage of the disinfectant **20** is transferred to the user thereby.

(65) In some embodiments, the device **10**, including the disinfectant reservoir and dispenser portion **14** (including the dispensing surface portion **16**) and the disinfectant **20**, is configured such that the disinfectant **20** is available/dispensable at the dispensing surface portion **16** via touching or swiping of the dispensing surface portion **16** by a user for at least 2 hours, at least 3 hours, at least 4 hours, at least 5 hour or at least 6 hours after the dispensing surface portion **16** is initially exposed.

(66) The volume of disinfectant **20** may be any biocompatible disinfectant (i.e., safe and effective for use with humans, such as on human skin), such as any topical disinfectant effective in killing and/or preventing reproduction of disease causing pathogens (such as viruses and bacteria, for example) when the disinfectant **20** and the pathogens physically interact. The disinfectant **20** may be effective on disinfecting a person's skin and in addition to the surface of an inanimate object (such as a surface comprising plastic, metal, glass, paper, cardboard, etc.). For example, the disinfectant **20** may comprise an alcohol sanitizer and/or a non-alcohol sanitizer. In some embodiments, the disinfectant **20** comprises ethyl, isopropyl, ethanol (ethyl alcohol), triclosan, triclocarban, benzalkonium chloride, benzethonium chloride or a combination thereof. In some embodiments, the disinfectant **20** comprises 1,2-hexanediol, ammonium bicarbonate, ammonium carbonate, benzalkonium chloride, benzalkonium chloride, chlorine dioxide, citric acid, dodecylbenzenesulfonic acid, ethanol, ethyl, glutaraldehyde, glycolic acid, hydrochloric acid, hypochlorous acid, isopropyl, isopropanol, lactic acid, L-lactic acid, octanoic acid, peroxyacetic acid, peroxyoctanoic acid, phenolic, potassium peroxymonosulfate, quaternary ammonium, silver,

silver ion, sodium carbonate, sodium carbonate peroxyhydrate, sodium chloride, sodium chlorite, sodium dichloroisocyanurate, sodium dichloroisocyanurate dihydrate, sodium dichloro-S-triazinetriene, sodium hypochlorite, thymol, triethylene glycol, triclosan, triclocarban, alcohol (e.g., at least 60% by volume), aloe gel, vinegar, an essential oil, aromatherapy compound, or a combination thereof. In some embodiments, the disinfectant **20** may comprise at least one essential oil, such as geranium, lavender, sweet marjoram, neroli, palmarosa, peppermint, petitgrain, rose, tea tree, thyme, linalool oil or a combination thereof. In some embodiments, the disinfectant **20** may be in liquid or gel form. In some embodiments, the disinfectant **20** may comprise a solution and/or a suspension, and may include at least solid disinfectants.

(67) It is also specifically disclosed herein that although embodiments of the on-demand dispensing devices (and related methods) of the present disclosure are described with respect to containing and dispensing a disinfectant (i.e., on-demand disinfectant dispensing devices), the devices may equally be employed to dispense any other solid, liquid or gel agent. For example, the devices may contain and be configured to dispense any pleasant or foul odorous and/or tasteful material (e.g., perfume, attractant/detractant-repellant (e.g., bug or insect repellent, etc.). As another example, the devices may contain and be configured to dispense a skin lotion (e.g., moisturizer, sunscreen, etc.), antiperspirant/deodorant, medication/medicine, lubricant, friction-enhancing material (e.g., a sticky or gritty material), any other biocompatible material, biohazard material or a combination thereof. In some such embodiments, the medication/medicine may be a medicant, a vitamin (vitamin C, B12, etc.) or supplement (e.g., caffeine, nicotine, etc.), a cannabinoid (e.g., cannabidiol (CBD)), delta-9-tetrahydrocannabinol (THC) or a food product (e.g., sugar, candy, etc.). As a further example, the devices may contain and be configured to dispense a paint. As another example, the devices may contain and be configured to dispense a cleaning product. As another example, the devices may contain and be configured to dispense a food product or foodstuff.

(68) As shown in FIG. 3, in some embodiments, the attachment portion **12** (and potentially the reservoir and dispenser portion **14**) may be configured such that the device **10** is worn by a user **1** on a passive piece of clothing (e.g., hat, shirt, coat, pant, belt, shoe, scarf, glove, sock, etc.) or another inanimate object **2** (sweatband, kinesiology/muscle tape, heat/cool pads, helmet, protective pad/brace/splint/cast, headphones, luggage, personal accessories, luggage, wallet, hand bag/purse, athletic equipment, etc.) that is configured to couple to (i.e., be worn or carried by) the user **1**. The device **10** may thereby be removably coupled to a passive portion of the user **1** that is spaced from the point/portion of contact of the user **1** that the user wishes to apply the disinfectant **20** to via touching of the dispensing surface portion **16**. As noted above, the attachment portion **12** may include an adhesive or mechanical connection mechanism that is configured to attach to a specific or general surface, such as to the clothing **2** or another inanimate object on/coupled to the user **1** as shown in FIG. 3. In use, the user **1** can thereby removably couple the device **10** to their clothing **2** or another inanimate object on/coupled to the user **1** on a passive portion of the user **1** (such as but not limited to over the user's **1** forearm, upper arm, chest, waist or thigh), and touch or wipe the dispensing surface portion **16** with one or more of their hands when the user **1** desires to disinfect their one or more of their hands (or another body portion or inanimate object touched by the user's **1** one or more hand). When the user **1** desires, the device **10** can be removed from the clothing **2** or another inanimate object on/coupled to the user **1** (preferably without damaging the surface outer surface thereof).

(69) As also discussed above and shown in FIG. 4, in some embodiments, the attachment portion **12** (and potentially the reservoir and dispenser portion **14**) may be configured such that the device **10** is worn by a user **1** directly on a passive portion of their skin **3**. The attachment portion **12** may thereby be configured to be biocompatible with a person's passive skin **3**, and the device **10** may be breathable or otherwise resistant to causing the user to sweat beneath the device **12**. For example, the device **10** may be configured to have an "invisible" feel when attached to a user's skin **3**. The device **10** may thereby be removably coupled to a passive portion of the skin **3** of the user **1** that is

spaced from the active portion or point/portion of contact of the user **1** that the user wishes to apply the disinfectant **20** to via touching of the dispensing surface portion **16**. In use, the user **1** can thereby removably couple the device **10** directly to their skin **3** on a passive portion of the user **1** (such as but not limited to over the back of the user's hand, forearm, upper arm or thigh), and touch or wipe the dispensing surface portion **16** with one or more of their hands when the user **1** desires to disinfect their one or more of their hands (or another body portion or inanimate object touched by the user's **1** one or more hand). When the user **1** desires, the device **10** can be removed from the skin **3** of the user **1** (preferably without hurting, irritating or otherwise damaging the skin **3**).

(70) As shown in FIGS. 5A-5M, in some embodiments, the attachment portion **12** (and potentially the reservoir and dispenser portion **14**) may be configured such that the device **10** is worn by a user **1** directly on their active skin **4** or another area/surface of the user **1** to cover/replace the portion (at least partially) by the dispensing surface portion **16**. As noted above, the "active" portion **4** of the user **1** may comprise an area that touches/makes contact with at least one other portion of the user **1**, another person or an inanimate communal object that will/could be touched by another person to prevent the transmission/passing of a pathogen from the active skin portion/area **4** of the user **1** to the other portion(s) of the user **1** (e.g., the user's **1** eyes, nose or mouth), directly the another person, or indirectly to another person through the communal inanimate object. The attachment portion **12** may thereby be configured to be biocompatible with a person's active skin area **4**, and the device **10** may be breathable or otherwise resistant to causing the user to sweat beneath the device **12**. The device **10** may be removably coupled to an active skin portion **4** of the user **1** which the user wishes to apply the disinfectant **20** with. In use, the user **1** can thereby removably couple the device **10** directly to an active skin portion **4** of the user **1** (such as but not limited to over the palm and/or finger(s) of the user **1**), and the user **1** can touch or wipe the dispensing surface portion **16** as desired to dispense the disinfectant **20**. When the user **1** desires, the device **10** can be removed from the active skin portion/area **4** of the user **1** (preferably without hurting, irritating or otherwise damaging the active skin portion/area **4**).

(71) As shown in FIG. 5A, in some exemplary embodiments, the device **10** may be configured (e.g., shaped and sized) to removably couple to and extend over (e.g., cover) the palm and at least a portion of at least one finger **4** of a hand of a user **1**. As another example, in some embodiments the device **10** may be configured (e.g., shaped and sized) to removably couple to and extend over (e.g., cover) just a portion of the palm **4** of a hand of a user **1**, as shown in FIGS. 5B-5E. In some other exemplary embodiments, the device **10** may be configured (e.g., shaped and sized) to removably couple to and extend over (e.g., cover) at least a portion of an interior side of a finger **4** of a hand of a user **1**, as shown in FIGS. 5F-5H. As another example, as shown in FIGS. 5I-5K, in some embodiments the device **10** may be configured (e.g., shaped and sized) to removably couple to and extend over (e.g., cover) just a portion of the forearm **4** of an arm of a user **1**. In some other exemplary embodiments, the device **10** may be configured (e.g., shaped and sized) to removably couple to and extend over (e.g., cover) at least a portion of an elbow **4** of an arm of a user **1**, as shown in FIGS. 5L-5H.

(72) The device **10** may thus be configured (e.g., shaped and sized) to removably couple to and extend over an area of a user **1** that is likely to contact another individual or a surface that may be contacted by another individual so as to dispense a liquid or gel agent **20**, such as but not limited to a disinfectant, thereon/thereto. The device **10** may act as a barrier between the user **1** and the other individual or surface, and also act to carry forward the liquid or gel agent **20** to the other individual or surface.

(73) In yet another embodiment, the device **10**, such as at least the attachment portion **12**, may be configured to attach to an inanimate object (not shown) that is not worn or carried by a user **1**. For example, the attachment portion **12** may be configured to removably (or fixedly) attach to a handle, knob, switch, arm rest, seat, steering wheel, transmission/shift lever, athletic equipment, medical equipment, office equipment, culinary equipment, military/defense equipment, packaging (e.g., a

shipping or product packaging), furniture, pet product, or any other item or surface that is communal (i.e., likely to be touched by more than one person) or that is positioned within/near a communal space area, surface or item.

(74) It is specifically noted that embodiments of the device **10** disclosed herein may be configured to attach/couple (removably or fixedly) to any surface of any object (living or inanimate).

Embodiments of the device **10** may be used on any surface to provide on-demand access to the disinfectant **20** contained therein for any purpose (such as to provide to directly provide the disinfectant **20** to a surface/portion or indirectly provide the disinfectant **20** to a surface/portion).

(75) In some embodiments, as shown in FIG. 7, the device **10** may be configured such that the appearance of a portion of the device **10**, such as the dispensing surface portion **16**, changes as the volume of disinfectant **20** within the reservoir and dispenser portion **14**. In this way, the device **10** may automatically visually and/or tactically indicate the particular volume of the disinfectant **20** within the reservoir and dispenser portion **14**, and thereby available to the user via the dispensing surface portion **16**, at any particular time. In this way and as shown in FIG. 7, as a device **10A** containing a first “full” volume of the disinfectant **20A** transitions to a device **10B** containing a second “medium” volume of the disinfectant **20B**, the color of at least a portion of the dispensing surface portion **16** (for example) may change. Similarly, as also shown in FIG. 7, as the device **10B** containing the second “medium” volume of the disinfectant **20B** transitions to a device **10C** containing a third “low” volume of the disinfectant **20B** (or no available disinfectant **20**), the color of at least a portion of the dispensing surface portion **16** (for example) may change again. It is noted that the device **10** may be configured to variably change colors as the volume of the disinfectant **20** changes, or may only change colors once when the level of disinfectant **20** is at least substantially depleted and/or the level available to a user is inadequate to disinfect (for example). For example, the reservoir and dispenser portion **14** and/or the disinfectant **20** may be configured to change color with changes in the temperature, pH and/or dryness/wetness (e.g., liquid vs. solid form) thereof. As the volume of the disinfectant **20** within the reservoir and dispenser portion **14** decreases (such as from being dispensed via the dispensing surface portion **16**, to a user and/or evaporating (or otherwise changing states), the temperature, pH and/or dryness/wetness (e.g., liquid/solid state) of the reservoir and dispenser portion **14** and/or the disinfectant **20** may change and cause a color change, such as with respect to a material/component/chemical/additive of or within the reservoir and dispenser portion **14** and/or the disinfectant **20**. In some embodiment, the reservoir and dispenser portion **14** and/or the disinfectant **20** may be configured to change color with time, independently of the actual volume of the disinfectant **20**. For example, the reservoir and dispenser portion **14** and/or the disinfectant **20** may include a pigment, ink dye or the like that degrades or absorbs over time such that the color thereof changes over time. In this way, the color of the device **10** can indicate to a user how long the device **10** has been in use, and thereby an indication of the potential state of the volume of the disinfectant **20** (e.g., the disinfectant **20** may evaporate over time).

(76) As another example, the device **10** may be configured such that the size, shape, surface texture and/or other physical dimension/aspect of the device **10** changes as the volume of the disinfectant **20** within the reservoir and dispenser portion **14** decreases to provide a tactile indication of the level thereof. For example, the dispensing surface portion **16** may include raised bumps or the like that flatten/shorten as the volume of the disinfectant **20** within the reservoir and dispenser portion **14** decreases.

(77) As noted above, the reservoir and dispenser portion of the on-demand dispensing devices of the present disclosure may include one or more layers or portions. For example, as discussed above with respect to the reservoir and dispenser portion **14**, the exemplary device **10** may include a dual/integral reservoir and dispenser layer or portion **14** that is configured as a reservoir that contains/holds the volume of the disinfectant **20** and a dispenser that forms the dispensing surface portion **16** and controls the amount of disinfectant **20** that flows/is present at the dispensing surface

portion **16** and is transferred to a user when the user contacts/wipes the dispensing surface portion **16**.

(78) An exemplary on-demand dispensing device **110** that includes separate and distinct reservoir and dispenser layers/portions is shown in FIG. **8**. The device **110** of FIG. **8** is substantially similar to the device **10** described above with respect to FIG. **1-7**, and therefore like reference numerals preceded with “1” are used to indicate like components, aspects, functions, processes or functions, and the description above directed to thereto equally applies, and is not repeated for brevity and clarity purposes.

(79) As shown in FIG. **8**, the device **110** includes a dispenser/dispensing portion or layer **130** overlying at least a portion of a reservoir layer or portion **132**. The reservoir layer or portion **132** is configured to contain the volume of disinfectant **120** therein. For example, as discussed above, the disinfectant **120** may be absorbed within the reservoir layer or portion **132** and/or the reservoir layer or portion **132** may form a pocket or cavity that contains the disinfectant **120**. The dispenser portion or layer **130** may be configured to control the release rate of the disinfectant **120** to/onto the dispensing surface portion **116**, and thereby to/onto the user, when the user contacts or wipes the dispensing surface portion **116**. For example, as shown in FIG. **8**, the dispenser portion or layer **130** may comprise pores, apertures, channels, cracks, valves, openings, pathways or other flowpaths **132** for the disinfectant **120** to flow or translate from the reservoir layer or portion **132**, through the dispenser portion or layer **130**, and to the dispensing surface portion **116**. The cross-sectional size, length/thickness, density, and/or total number, for example, of flowpaths **132** may be configured to allow/promote wicking/capillary action of the disinfectant **120** from the reservoir layer or portion **132** to/onto the dispensing surface portion **116** at a particular rate and, thereby, the release/dispense rate of the disinfectant **120** at the dispensing surface portion **116**. The dispenser portion or layer **130** is thereby configured to allow/promote movement of the disinfectant **120** therethrough (e.g., via capillary action) at a controlled rate to the dispensing surface portion **116** to keep it loaded/activated with the disinfectant **120**.

(80) Another exemplary embodiment of an on-demand dispensing device **210** according to the present disclosure is shown in FIGS. **9** and **10**. The device **210** of FIGS. **9** and **10** is substantially similar to the device **10** of FIG. **1-7** and the device **110** of FIG. **8**, and therefore like reference numerals preceded with “2” are used to indicate like components, aspects, functions, processes or functions, and the description above directed to thereto equally applies, and is not repeated for brevity and clarity purposes.

(81) As shown in FIG. **9**, the device **210** includes a reservoir and dispenser portion **214** that includes a plurality of discrete solid, gel and/or encapsulated portions **238** that each comprise the disinfectant **220**. The discrete portions **238** are embedded or distributed within an inner portion **236** of the reservoir and dispenser portion **214** below the dispensing surface portion **216**. The discrete portions **238** are configured to selectively release at least some of the disinfectant **220** to allow the disinfectant **220** to travel to the dispensing surface portion **216**. For example, the discrete portions **238** may be configured to release disinfectant **220** upon the application of a particular pressure and/or temperature threshold. As shown in FIGS. **9** and **10**, the device **210** may be attached to a user or surface **4**, and the release mechanism may be applied to the device **210** to release the disinfectant **220** and, thereby, force or allow the disinfectant **220** to travel to the dispensing surface portion **216** (and thereby to a user therefrom).

(82) As shown in FIG. **10**, in one example the discrete portions **238** may comprise encapsulated portions **238** that rupture and release the disinfectant **220** upon the application of pressure thereto. In such an embodiment, the device **210** may be coupled to a user's inner hand/palm **4**, for example, and the user can make a first to squeeze and “crush” the encapsulated portions **238** to release the disinfectant **220**. However, it is noted the device **210** may be configured and/or used with a myriad of differing applications and/or release mechanisms to release the disinfectant **220** from the discrete portions **238**.

(83) Another exemplary embodiment of an on-demand dispensing device **310** according to the present disclosure is shown in FIG. **11**. The device **310** of FIG. **11** is substantially similar to the device **10** of FIG. **1-7**, the device **110** of FIG. **8** and the device **210** of FIGS. **9** and **10**, and therefore like reference numerals preceded with “3” are used to indicate like components, aspects, functions, processes or functions, and the description above directed to thereto equally applies, and is not repeated for brevity and clarity purposes.

(84) As shown in FIG. **11**, the device **310** includes a plurality of stacked or overlying reservoir and dispenser portions/layers **314**. The reservoir and dispenser portions/layers **314** each include a back side surface **318** that overlies and is removably coupled/attached to the top side of an immediately underlying reservoir and dispenser portions/layers **314** (or the attachment layer or portion **312**). As noted above, the reservoir and dispenser portions/layers **314** may be comprise of one or more portions, layer and/or materials.

(85) The top side surface of the upper most reservoir and dispenser portions/layers **314** of the device **310** comprises or forms the dispensing surface portion **316**, as shown in FIG. **11**. The reservoir and dispenser portions/layers **314** may be removably coupled to each other via any adhesive or mechanical connection (such as a hook and loop fastener) that is configured such that an uppermost exposed reservoir and dispenser portions/layers **314** can be manually removed from the device **310** (e.g., manually peeled off the device **310**) to expose the immediately underlying reservoir and dispenser portions/layers **314** when the volume of disinfectant **320** in the uppermost exposed reservoir and dispenser portions/layers **314** is depleted/dried.

(86) Another exemplary embodiment of an on-demand dispensing device **410** according to the present disclosure is shown in FIG. **12**. The device **410** of FIG. **12** is substantially similar to the device **10** of FIG. **1-7**, the device **110** of FIG. **8**, the device **210** of FIGS. **9** and **10** and the device **310** of FIG. **11**, and therefore like reference numerals preceded with “4” are used to indicate like components, aspects, functions, processes or functions, and the description above directed to thereto equally applies, and is not repeated for brevity and clarity purposes.

(87) As shown in FIG. **12**, the on-demand disinfectant dispensing device **410** comprises at least one reservoir area **442** and at least one dispensing area **440**. The reservoir area **442** comprises an area of the reservoir and dispenser portion/layer **414** that comprises the volume of the disinfectant **420**, and the dispensing area **440** comprises an area of the reservoir and dispenser portion/layer **414** that is configured to control the release of the volume of the disinfectant **420** and comprises the dispensing surface portion **416** where the disinfectant **420** is ultimately released. For example, as shown in FIG. **12**, the dispensing area **440** may comprise a plurality of holes, pores or other passages **432** that are spaced from, but in communication with, the reservoir area **442**.

(88) The device **410** is configured that the application of pressure on the reservoir area **442** forces disinfectant **420** from the reservoir area **442** and to and through the dispensing area **440** to the dispensing surface portion **416**. For example, as shown in FIG. **12**, the device **410** may be configured such that pressure applied on the reservoir area **442** along one or more particular directions may act to force the disinfectant **420** through the dispenser portion/layer **414** and to and through the apertures/passageways **432** of the dispensing area **440**. In this way, the device **410** may be configured to release/dispense the disinfectant **420** based on a the application of pressure (e.g., hand or finger swipe) on and/or along the dispensing area **440** to dispense the disinfectant **420** through the dispenser portion/layer **414** and to and through the apertures/passageways **432** of the dispensing area **440**. The trajectory/directional application of pressure/force on the reservoir area **442** toward the dispensing area **440** may be more effective in dispensing the disinfectant **420** or required to dispense the disinfectant **420**.

(89) Another exemplary embodiment of an on-demand dispensing device **510** according to the present disclosure is shown in FIGS. **13-15**. The device **510** of FIGS. **13-15** is substantially similar to the device **10** of FIG. **1-7**, the device **110** of FIG. **8**, the device **210** of FIGS. **9** and **10**, the device **310** of FIG. **11** and the device **410** of FIG. **12**, and therefore like reference numerals preceded with

“5” are used to indicate like components, aspects, functions, processes or functions, and the description above directed to thereto equally applies, and is not repeated for brevity and clarity purposes.

(90) As shown in FIGS. **13-15**, the on-demand disinfectant dispensing device **510** comprises at least one reservoir and pump area **542**, at least one dispensing area **540** and at least one defined flowpath/channel **544** for the flow of the disinfectant **520** from the reservoir and pump area **542** to the dispensing area **542**. The reservoir and pump area **542** may comprise a volume of the disinfectant **520** contained within a defined flexible internal cavity, opening or pouch that it is fluid communication with at least one defined flowpath/channel **544**, as shown in FIGS. **13-15**. The reservoir and pump area **542** may form a raised area that is visually and/or tactically identifiable by a user. The flexible internal cavity of the reservoir and pump area **542** may be substantially sealed but for the at least one defined flowpath/channel **544** such that compression of the reservoir and pump area **542** forces the disinfectant **520** out from the cavity and into and through the at least one defined flowpath/channel **544**. As shown in FIG. **14**, the area surrounding the reservoir and pump area **542**, or at least positioned between the reservoir and pump area **542** and the reservoir and pump area **542** may be sealed off or blocked by a sealing portion **546**. As shown in FIG. **15**, the at least one defined flowpath/channel **544** may extend through the sealing portion **546** and is configured to contain and direct a flow of the disinfectant **520** from the of the flexible internal cavity of the reservoir and pump area **542** to the dispensing area **542**.

(91) The dispensing area **540** may be configured to hold/contain a volume of the disinfectant **520** delivered from the reservoir and pump area **542** via the at least one flowpath/channel **544** and, ultimately, control the release/dispensing of the disinfectant **520** at the dispensing surface portion **516**, as discussed above. The reservoir and pump area **542** may thereby serve as an on-demand supply of the disinfectant **520** for the dispensing area **540** as the disinfectant **520** therein/thereof becomes depleted. In use, a user can apply pressure to the outside or top side **519** of the reservoir and pump area **542** to compress/pressurize the internal cavity thereof, and thereby force a portion of the volume of the disinfectant **520** from the internal cavity, into and through the at least one defined flowpath/channel **544**, and to the dispensing area **542**. In some embodiments, the dispensing area **542** is configured to control the rate of release of the disinfectant **520** from the dispensing surface portion **516**. In some embodiments, the application of pressure on the reservoir and pump area **542** may force the disinfectant **520** through the dispensing area **542** and release disinfectant **520** from the dispensing surface portion **516**.

(92) Another exemplary embodiment of an on-demand dispensing device **610** according to the present disclosure is shown in FIG. **16**. The device **510** of FIG. **16** is substantially similar to the device **10** of FIG. **1-7**, the device **110** of FIG. **8**, the device **210** of FIGS. **9** and **10**, the device **310** of FIG. **11**, the device **410** of FIG. **12** and the device **510** of FIGS. **13-15**, and therefore like reference numerals preceded with “6” are used to indicate like components, aspects, functions, processes or functions, and the description above directed to thereto equally applies, and is not repeated for brevity and clarity purposes.

(93) As shown in FIG. **16**, the on-demand disinfectant dispensing device **610** comprises at least one reservoir and pump area **642**, at least one dispensing area **640** and at least one defined flowpath/channel **644** for the flow of the disinfectant **620** from the reservoir and pump area **642** to the dispensing area **642** and, ultimately, out of the dispensing surface portion **616**. As shown in FIG. **16**, the dispensing device **610** differs from the dispensing device **610** as it is configured for an active skin portion **4** of a user **1**. The pump area **642** is configured such that closing of the user's **1** hand/palm compresses the internal cavity thereof to compress/pressurize the cavity and thereby force the disinfectant **620** through a plurality of channels **644** to the dispensing area **640**. In some embodiments, the dispensing area **640** may comprise a plurality of spaced release points or areas.

(94) The device **610** may be configured such that the disinfectant **620** is dispensed due to movement of the user **1**, such as but not limited to a haptic gesture of the user **1**. For example, as

shown in FIG. 16, the device **610** may be configured such that the reservoir and pump area **642** is positioned in a palm area of the device **610** (i.e., that is positioned on the user's **1** palm when the device **610** is attached to the user's inner hand **4**), and include a plurality of channels **644** extending to a plurality of dispensing areas **640** (such as near the user's **1** finger(s)). As shown in FIG. 16, in some embodiments the device **610** may extend over the user's **1** palm and at least one finger when attached to the user's **1** inner hand **4**. In this way, a user **1** can selectively apply the disinfectant **20** to their palm and/or at least one finger simply by compressing their hand or making a first (i.e., compressing the internal cavity of the reservoir and pump area **642**) (or otherwise compressing the reservoir and pump area **642**). In one exemplary embodiment, the device **610** may also extend to at least a portion of the back of the user's **2** hand **4**, such as extending over/around the tip of at least one finger of the user's **1** hand **4**.

(95) Another exemplary embodiment of an on-demand dispensing device **710** according to the present disclosure is shown in FIG. 17. The device **610** of FIGS. 13-15 is substantially similar to the device **10** of FIG. 1-7, the device **110** of FIG. 8, the device **210** of FIGS. 9 and 10, the device **310** of FIG. 11, the device **410** of FIG. 12, the device **510** of FIGS. 13-15 and the device **610** of FIG. 16, and therefore like reference numerals preceded with "7" are used to indicate like components, aspects, functions, processes or functions, and the description above directed to thereto equally applies, and is not repeated for brevity and clarity purposes.

(96) The dispensing device **710** is substantially identical to the dispensing device **610** but for the inclusion of a plurality of reservoir and pump areas **742** (or a plurality of internal cavities of a reservoir and pump area **742**) and a plurality of portions that extend over a plurality of a user's **1** fingers when the device **710** is coupled to the user's inner hand **4**. As shown in FIG. 17, the device **710** is may thereby be configured to suit any wearer (e.g., any body portion or any surface of any inanimate object) and any movement/re-arrangement of the device **710** to compress the reservoir and pump areas **742** and cause the disinfectant **720** to be selectively dispensed.

(97) Another exemplary embodiment of an on-demand dispensing device **810** according to the present disclosure is shown in FIG. 18. The device **810** of FIG. 18 is substantially similar to the device **10** of FIG. 1-7, the device **110** of FIG. 8, the device **210** of FIGS. 9 and 10, the device **310** of FIG. 11, the device **410** of FIG. 12, the device **510** of FIGS. 13-15, the device **610** of FIG. 16 and the device **710** of FIG. 17, and therefore like reference numerals preceded with "8" are used to indicate like components, aspects, functions, processes or functions, and the description above directed to thereto equally applies, and is not repeated for brevity and clarity purposes.

(98) As shown in FIG. 18, the reservoir and dispenser portion/layer **814** of the on-demand disinfectant dispensing device **810** comprises at least one (manually) flexible and porous polymer member comprising internal voids in communication with the outer dispenser surface portion **816** thereof. The member may be comprised of any flexible porous polymer. For example, the polymer member may be formed of silicone, polyurethane, hydrogel or a combination thereof. The member may form an elongate and/or sheet-like shape, and may be arranged into a roll form (which may facilitate the application of the device **810**). The member may be any shape and/or length to suit a particular surface.

(99) Also shown in FIG. 18, the polymer member of the device **810** includes a disinfectant agent **820** contained within the internal voids of the member. The member is configured such that the disinfectant **820** is naturally drawn to the outer dispenser surface portion **816** from within the internal voids, such as due to capillary action (and/or evaporation of the disinfectant **820** at the dispenser surface portion **816**).

(100) In some embodiments, the device **810** may include an adhesive or attachment mechanism coupled to a backside of the polymer member configured to attach/affix the device **810** to a surface, as discussed above (and potentially a protective film thereover). In some other embodiments, the device **810** may be void of an adhesive or attachment mechanism coupled to a backside of the polymer member (which may be applied/coupled thereto just prior to being coupled to a surface,

for example).

(101) In some embodiments, the member may include perforations, cuts, gaps or the like (not shown) configured to allow a portion(s) of the member to be manually separated. In some embodiments, the device **810** may include a dispenser device that holds the member and allows the member to be dispensed therefrom. In some such embodiments, the dispenser device may include a cutting implement configured to selectively cut the member.

(102) Another exemplary embodiment of an on-demand dispensing device **910** according to the present disclosure is shown in FIG. **19**. The device **910** of FIG. **19** is substantially similar to the device **10** of FIG. **1-7**, the device **110** of FIG. **8**, the device **210** of FIGS. **9** and **10**, the device **310** of FIG. **11**, the device **410** of FIG. **12**, the device **510** of FIGS. **13-15**, the device **610** of FIG. **16**, the device **710** of FIG. **17** and the device **810** of FIG. **18**, and therefore like reference numerals preceded with “9” are used to indicate like components, aspects, functions, processes or functions, and the description above directed to thereto equally applies, and is not repeated for brevity and clarity purposes.

(103) As shown in FIG. **19**, the device **910** includes a pocket portion **950** with an internal cavity **957** and the reservoir portion **932** that contains a disinfectant **920** therein configured to couple (e.g., removably) within the internal cavity **957**. In some embodiments, the pocket portion **950** may be formed of or comprise a backing layer or portion **952** that is configured to prevent the disinfectant **920** from passing therethrough. For example, the backing layer or portion **952** may be waterproof or water resistant, as shown in FIG. **19**. As also shown in FIG. **19**, the pocket portion **950** may include a front portion **954**. The front portion **954** and the backing portion **952** may cooperate to form the internal cavity **957** therebetween, as shown in FIG. **19**.

(104) In some embodiments, the front portion **954** may include or define an opening or window such that an outer surface of the reservoir portion **932** is exposed when the reservoir portion **932** is positioned within the pocket portion **950**. In such an embodiment, the reservoir portion **932** may comprise the reservoir portion and the dispensing portion **914**, as discussed above. In this way, the outer surface of the reservoir portion **932** may define the disinfectant dispensing surface **916**.

(105) In some other embodiments (not shown), the front portion **954** may extend over at least a substantial portion of the outer surface of the reservoir portion **932** when the reservoir portion **932** is positioned within the pocket portion **950**. In such an embodiment, the reservoir portion **932** may comprise the reservoir portion of the device **910** as discussed above, and the front portion **954** may comprise (and thus be configured as) the dispensing portion **914** of the device **910**, as discussed above. In this way, the outer surface of the front portion **954** may define the disinfectant dispensing surface **916**.

(106) The backside of the pocket portion **950** may include the attachment layer or portion **912** of the device **910** and be configured to couple (removably or fixedly) to any myriad of surfaces, as discussed above.

(107) Another exemplary embodiment of an on-demand dispensing device **1010** according to the present disclosure is shown in FIGS. **20** and **21**. The device **1010** of FIGS. **20** and **21** is substantially similar to the device **10** of FIG. **1-7**, the device **110** of FIG. **8**, the device **210** of FIGS. **9** and **10**, the device **310** of FIG. **11**, the device **410** of FIG. **12**, the device **510** of FIGS. **13-15**, the device **610** of FIG. **16**, the device **710** of FIG. **17**, the device **810** of FIG. **18** and the device **910** of FIG. **19**, and therefore like reference numerals preceded with “10” are used to indicate like components, aspects, functions, processes or functions, and the description above directed to thereto equally applies, and is not repeated for brevity and clarity purposes.

(108) As shown in FIGS. **20** and **21**, the device **1010** is substantially similar to the device **910** discussed above with respect to FIG. **19**. Device **1010** differs from the device **910** in that the pocket portion **1050** is integrated into another object **2**, such as a clothing item or other item that would be worn or carried by a user. As shown in FIGS. **20** and **21**, the front portion **1054** of the pocket portion **1050** defines a window or opening **1056** such that the outer surface of the reservoir portion

1032 is exposed when the reservoir portion **1032** is positioned within the internal cavity **1057** of the pocket portion **950**. The reservoir portion **1032** thereby comprises the reservoir portion of the device **1010**, and the front portion **1054** comprises (and is thus configured as) the dispensing portion **1014** of the device **101**. The outer surface of the front portion **1054** also thereby defines the disinfectant dispensing surface **1016**, as shown in FIGS. **20** and **21**.

(109) Another exemplary embodiment of an on-demand dispensing device **1110** according to the present disclosure is shown in FIG. **22**. The device **1110** of FIG. **22** is substantially similar to the device **10** of FIG. **1-7**, the device **110** of FIG. **8**, the device **210** of FIGS. **9** and **10**, the device **310** of FIG. **11**, the device **410** of FIG. **12**, the device **510** of FIGS. **13-15**, the device **610** of FIG. **16**, the device **710** of FIG. **17**, the device **810** of FIG. **18**, the device **910** of FIG. **19** and the device **1010** of FIGS. **20** and **21**, and therefore like reference numerals preceded with “11” are used to indicate like components, aspects, functions, processes or functions, and the description above directed to thereto equally applies, and is not repeated for brevity and clarity purposes.

(110) As shown in FIG. **22**, the device **1110** is substantially similar to the device **1010** discussed above with respect to FIGS. **20** and **21**. Device **1110** differs from the device **1010** in that the front portion **1154** extends over at least a substantial portion of the outer surface of the reservoir portion **1132** when the reservoir portion **1132** is positioned within the internal cavity **1157** of the pocket portion **1150**. The reservoir portion **1132** comprises the reservoir portion of the device **1110** as discussed above, and the front portion **1154** comprises (and thus is configured as) the dispensing portion **1114** of the device **1110**, as discussed above. In this way, the outer surface of the front portion **1154** defines the disinfectant dispensing surface **1116**.

(111) In some exemplary embodiments, the present disclosure provides for on-demand agent (e.g., disinfectant) dispensing devices and kits, and related methods utilizing such device and kits, which can be removably affixed to an object (such as a user or a surface of an inanimate object) that provide easy, available access to a supply of the agent over an extended period of time. The devices are configured as a patch that is configured to efficiently provide the agent on an on-demand basis via a step of apply pressure to or compressing the patch in its thickness direction (and potential along a length of the patch, such as a wiping or swiping motion/pathway).

(112) The on-demand agent dispensing patches provide a simple, cost effective way to dispense the agent. The patches are self-contained, and can be used with any agent that can be applied to a “dry” patch, while providing a no spill dispensing solution that does not necessitate pouring or spraying the agent prior to each application or dispensing. In some embodiments, the patch may be configured to be removably affixed to a user, such as to the user's skin or the user's clothing (or any other inanimate object carried or worn by the user). In such a configuration, the on-demand agent dispensing patch provides a wearable device for dispensing the agent. The on-demand agent dispensing wearable devices may be configured to be removably affixed to a contact of a user or object that would benefit from having the agent thereon or thereat, such as on the inside of a user's hand (e.g., on the palm and/or fingers) with the agent being a disinfectant. In this way, the active on-demand agent dispensing wearable patch can be applied over an “active” portion of the user (e.g., a user's elbow, palm, finger, etc.) or object and replace the portion with the outer surface of the patch.

(113) In some embodiments, the on-demand agent dispensing patch may be configured to be wearable such that it is removably affixed to a passive portion of the user's skin (or an object worn/carried by the user) (or on an inanimate object remote from the user) that is spaced from the point/portion of contact of the user, to allow for selective application of the agent via contact of the outer face of the patch via a user pressing on/compressing the patch. For example, a passive on-demand agent dispensing wearable patch may be removably affixed to the back of a user's hand or on a forearm, or on their clothing, and the user may swipe their finger(s)/hand on/over the exposed outer face of the patch to dispense the agent thereon. In such a passive dispensing embodiment, the on-demand agent dispensing wearable patch provides quick and discrete on-demand access to the

agent where swiping/contacting the device causes the agent to be dispensed on/to the person's point/portion of contact (e.g., their hand(s) or other skin surface).

(114) The on-demand agent dispensing patch disclosed herein can thereby be applied to an active or passive surface portion of a user (or an object) to provide the agent thereon/thereat. In this way, when the agent is a disinfectant, the on-demand dispensing patch can provide an amount/level of disinfectant to a user.

(115) FIGS. **23-33** illustrate another exemplary agent dispensing patch device **1210** according to the present disclosure. The device **1210** is substantially similar to the device **10** of FIG. **1-7**, the device **110** of FIG. **8**, the device **210** of FIGS. **9** and **10**, the device **310** of FIG. **11**, the device **410** of FIG. **12**, the device **510** of FIGS. **13-15**, the device **610** of FIG. **16**, the device **710** of FIG. **17**, the device **810** of FIG. **18**, the device **910** of FIG. **19**, the device **1010** of FIGS. **20** and **21**, and the device **1110** of FIG. **22**, and therefore like reference numerals preceded with “12” are used to indicate like components, aspects, functions, processes or functions, and the description above directed to thereto equally applies, and is not repeated for brevity and clarity purposes.

(116) As noted above, the agent may be any liquid or gelatinous agent that would benefit from, or lend itself to, being available on demand over a period of time, and being dispensed in doses or relatively small volumes. For example, the patch device **1210** may be used with a liquid or gelatinous sanitizing/disinfecting agent (i.e., a sanitizer or disinfectant) so that the sanitizing/disinfecting agent is available on demand to a user or an extended period of time, and a volume there can be dispensed for use easily and quickly from the patch device **1210** without having to open or otherwise access a container or package of the sanitizing/disinfecting agent.

(117) As shown in FIGS. **23-25**, in some embodiments, the on-demand agent dispensing patch device **1210** may be a flexible patch configured to contain, and provide on-demand dispensing of, the agent via compression of the patch in a thickness direction thereof.

(118) As shown in FIGS. **23-25**, in some embodiments, the on-demand agent dispensing patch device **1210** may include at least one reservoir dispenser portion or layer **1211** and at least one attachment portion or layer **1214**. The attachment layer **1214** may extend beneath, or underlie, the reservoir dispenser portion **1211**. The reservoir dispenser portion **1211** may thereby extend over the attachment layer **1214** in a thickness direction such that a top outer exposed face **1220** of the reservoir dispenser portion or layer **1211** forms the top outer exposed face of the patch device **1210** onto which the agent is applied, and the reservoir dispenser portion **1211** may be configured to absorb, so as to contain, the agent. The on-demand agent dispensing patch device **1210** may further include at least one backer layer **1240** positioned between the attachment layer **1214** and the reservoir dispenser portion **1211** in the thickness direction, as shown in FIGS. **23-25**. The backer layer **1240** may be impervious to the agent such that the backer layer **1240** prevents the agent from interacting with the attachment layer **1214**. As explained further below, the attachment layer **1214** may comprise an adhesive layer, and the backer layer **1240** may thereby prevent the agent from deteriorating or interfering with the adhesive. Further, the backer layer **1240** may prevent the agent from penetrating through the patch device **1210** in the thickness direction and interacting with the object that the patch device is affixed to, and thereby aid in maintaining or containing the agent in the reservoir dispenser portion **1211**. The backer layer **1240** may also provide a consistent solid surface to apply to couple with the attachment layer **1214**.

(119) As explained further below, the patch device **1210** may be provided to user “dry” such that the reservoir dispenser portion **1211** (and the other portions of the patch device **1210**) is void of the agent absorbed therein. For example, the reservoir dispenser portion **1211** (and the other portions of the patch device **1210**) may be completely void of the agent. In such embodiments, the patch device **1210** may form part of a device, system or kit that includes the patch device **1210** and a container of the agent that is separate and distinct from the patch device **1210**, as discussed further below with reference to FIGS. **30** and **31**.

(120) In some other embodiments, the reservoir dispenser portion **1211** (and the other portions of

the patch device **1210**) may not have the agent absorbed therein, but the agent may be contained within a manually breakable encapsulation that is provided in, or adjacent to, the reservoir dispenser portion **1211** such that a user can manually break the encapsulation to release the agent and allow the reservoir dispenser portion **1211** to absorb the agent so that the agent is contained within the reservoir dispenser portion **1211**. The encapsulation may be a manually breakable shell or envelope. For example, in one exemplary embodiment, the encapsulation may be a foil cover or envelope, a polymer shell or container, or a combination thereof, in whole or in part.

(121) The attachment portion **1214** may comprise an attachment side or surface **1215** that is configured to affix/couple the patch device **1210** to an object (removably or fixedly) (e.g., a user skin or a surface of an inanimate object, as described above and further below). A back side **42** of the backer layer **1240** may be coupled to and overlie at least a portion of a front side **18** of the attachment portion **1214**, as shown in FIGS. 23-25. Similarly, a back side **13/17** of the reservoir dispenser portion **1211** may be coupled to and overlie at least a portion of a front side **41** of the backer layer **1240**, as shown in FIGS. 23-25. The agent reservoir dispenser portion **1211** is configured to control a dispense rate (i.e., time release) of the volume of an agent to a user at an exposed outer dispensing surface portion **1220** thereof when a user compresses the agent reservoir dispenser portion **1211** in thickness direction. In some embodiments, the agent reservoir dispenser portion **1211** may be refillable after one or more dispensing by applying a volume of the agent to the exposed outer dispensing surface portion **1220** to allow the agent reservoir dispenser portion **1211** to absorb the applied volume of the agent.

(122) The patch device **1210** (e.g., the attachment portion **1214**, the backer layer **1240**, and the agent reservoir dispenser portion **1211**) may be of any size and any shape. In some embodiments, the patch device **1210** may be relatively flat or thin in a thickness direction (e.g., comprise a patch, sheet or like arrangement). In some embodiments, the size and/or shape of the patch device **1210** may correspond to a particular surface/object to which it can be removably coupled to. In this way, the patch device **1210** may be configured to a particular usage (e.g., shaped and sized to removably attach to a particular object or body portion of a user). The patch device **1210** (e.g., the attachment portion **1214** and the agent reservoir dispenser portion **1211**) may be relatively flexible, such as easily manually flexible.

(123) The attachment portion **1214** may comprise an adhesive layer configured to removably couple the patch to a surface, the adhesive layer defining the inner or back face/attachment side **1215** of the patch device **1210**. As shown in FIGS. 23-25, the attachment side **1215** of the attachment portion **1214** may define the backside or underside of the patch device **1210** when in use, such that the attachment side **1215** defines a backside attachment surface of the patch device **1210** that is configured to abut or overlie another surface when the patch device **1210** is coupled thereto. In some embodiments, the attachment portion **1214** may include an adhesive on (or that forms) the attachment surface **1215** that is configured to removably couple the patch device **1210** to a surface.

(124) In some embodiments, the attachment portion **1214** may include an adhesive that is configured to removably couple the patch device **1210** to an inanimate object and/or a user (e.g., skin or clothing of a user). In some such embodiments, the adhesive may comprise a pressure sensitive adhesive (PSA). In some such embodiments, the attachment portion **1214** may be configured to directly removably attach to skin of a user via a biocompatible (and/or medical grade) adhesive, such as a biocompatible PSA, and/or an alcohol resistant adhesive. In some embodiments, the adhesive of the attachment portion **1214** may comprise an acrylic adhesive, an epoxy adhesive, a styrene block co-polymer adhesive or a combination thereof. In some such embodiments, the adhesive of the attachment portion **1214** may comprise an acrylate, such as methacrylates, epoxy diacrylates (i.e., a vinyl resin) or a combination thereof. In some such embodiments, the adhesive attachment portion **1214** may comprise an acrylic-based pressure-sensitive adhesive. In some embodiments, the adhesive of the attachment portion **1214** may

comprise spirit gum (mastic), matte spirit gum, liquid latex, thickened latex, flexible collodion or a combination thereof. In some such embodiments, the adhesive may comprise a biodegradable, natural and/or organic adhesive. In some embodiments, the tack, adhesion, shear strength and breathability of the adhesive of the attachment portion **1214** may be configured such that the patch device **1210** is biocompatible with respect to a user's skin.

(125) In some embodiments, the attachment portion **1214** may be formed of an adhesive that covers, surrounds or is otherwise integrated with a scrim layer. The adhesive-scrim construct may form an integrated adhesive-scrim layer that is laid or applied to the backside **1242** of the backer layer **1240** or the back side **1213/1217** of the agent reservoir dispenser portion **1211**, and coupled thereto via the adhesive.

(126) In some other embodiments (not shown), the attachment portion **1214** may include a mechanical mechanism and/or physical configuration operative to removably attach the device to a surface or object. For example, the attachment portion **1214** may include and/or comprise a strap, hook-and-loop (or hook-and-hook) fastener, snap fastener, button, strap, elastic, suction cup/member, zipper, threaded post/aperture, magnet or any other fastener mechanism that is configured to removably couple the patch device **1210** to another surface/object. In some embodiments, the attachment portion **1214** comprises a clip or flap member that extends from the back face. It is noted that the particular design and configuration can of the attachment portion **1214** can take on any form with respect to a particular surface/object sufficient to removable couple the patch device **1210** to the surface/object.

(127) As shown in FIGS. **24** and **25**, in some embodiments, the patch device **1210** may include a removable attachment protective film or liner **1230** extending over the back side **1215** of the attachment layer **1214**. An inner side **1232** of the attachment protective liner **1230** may be configured to cover and protect the attachment layer **1214** prior to use (or when otherwise not in use), as shown in FIGS. **24** and **25**. As also shown in FIGS. **24** and **25**, an outer or back side **1231** of the protective liner **1230** may define the outer back side of the patch device **1210** prior to being affixed to a surface (object/person). The protective liner **1230** may thereby be configured to be manually removed from the attachment layer **1214** (e.g., peeled off) such that the attachment layer **1214** remains coupled to the patch device **1210** and is effective in coupling the patch device **1210** to a surface. In some embodiments, the protective liner **1230** may comprise a plastic/polymer, coated paper, metallic/metalized layer (e.g., a foil layer or aluminized material layer) or a combination thereof. In some embodiments, the protective liner **1230** may include a tab to aide in manually removing (e.g., peeling) the protective liner **1230** from the attachment surface **1215** of the adhesive layer **1214**, as shown in FIGS. **23** and **24**.

(128) As noted above, in some embodiments, the patch device **1210** may include at least one at least one backer layer or film **1240** positioned between the attachment layer **1214** and the agent reservoir dispenser portion **1211** in the thickness direction, as shown in FIGS. **23-25**. The at least one backer layer **1240** may be substantially impervious to the agent. The backer layer **1240** may support the attachment mechanism **1214** (e.g., an adhesive and/or mechanical fastener) (i.e., the attachment mechanism may be coupled to bottom/back side **1215** of the backer layer). Further, the agent reservoir dispenser portion **1211** may be coupled to and overly (e.g., directly overly) a top/upper side of the backer layer **1240**, as shown in FIGS. **23-25**.

(129) In some embodiments, the backer layer **1240** comprises at least one layer of a fabric (woven or non-woven), plastic or latex. For example, the backer layer **1240** may comprise a breathable fabric, such as a woven (or non-woven) nylon, polyester or Gore-Tex layer. In some embodiments, the backer layer **1240** may be flexible, and may comprise a water absorbable and/or air permeable fabric layer (particularly in embodiments of the patch device **1210** for use directly on the skin of a user, as described further below). In some other embodiments, the backer layer **1240** may be substantially impervious to the agent and to air. In some embodiments, the backer layer **1240** may comprise a solid sheet of material, such as at least one polymer layer, film or sheet. In some such

embodiments, the backer layer **1240** may comprise a polyethylene or polypropylene layer, film or sheet. In some embodiments, the backer layer **1240** may comprise at least one polyethylene layer, polypropylene layer, styrene layer, polyetheretherketone layer, acrylic layer, polyvinyl chloride layer, polyurethane layer, Teflon (Polytetrafluoroethylene) layer, syrlin layer or a combination thereof. In some embodiments, the backer layer **1240** may comprise a thickness of 0.5-3 mm, such as about 1 mm.

(130) In some embodiments, the patch device **1210** may comprise a dispenser protective liner, film or layer (not shown) extending over the top or outer dispensing surface **1220** of the agent reservoir dispenser portion **1211**. An inner side of the dispenser protective liner may be configured to cover and protect the agent reservoir dispenser portion **1211** prior to use (or when otherwise not in use). An outer or top/front side of the protective liner may define the outer front/top side of the patch device **1210** prior to use thereof (e.g., prior to dispensing and/or an application of agent applied to the agent reservoir dispenser portion **1211**). The dispenser protective liner may thereby be configured to cover and protect the dispensing surface portion **1220** prior to use (or when otherwise not in use). In some embodiments, the dispenser protective liner may comprise a plastic/polymer or metallic/metalized layer (and potentially an adhesive). Removal of the dispenser protective liner may thereby activate the patch device **1210** for use.

(131) In some embodiments, the dispensing surface portion **1220** (and/or the outer surface of the protective film liner) may include a visual and/or tactile indication (not shown), or be configured such that a visual and/or tactile indication can be drawn or otherwise formed thereon. For example, the dispensing surface portion **1220** (and/or the outer surface of the protective film liner) may include a logo, name, trademark or other visual indication that may enhance the aesthetic look and/or feel of the patch device **1210**. As another example, the outer surface of the cover or protective film liner may be configured as a paper, chalkboard or whiteboard type configuration to allow for personalization of the patch device **1210**. In some embodiments, the outer surface of the cover or protective liner comprises at least one of a visible light reflective material and an illumination device thereon. In some embodiment the protective liner may include a tab to aide in manually removing (e.g., peeling) the protective liner from the patch device **1210**/agent reservoir dispenser portion **1211**.

(132) The agent reservoir dispenser portion **1211** may comprise one or more layers and/or more materials. In some embodiments, the agent reservoir dispenser portion **1211** may comprise a single layer comprised of one or more materials. In some other embodiments, as discussed above and further below, the agent reservoir dispenser portion **1211** may comprise one or more reservoir layers or portions **1212** and one or more dispenser layers or portions **1216** that is/are separate and distinct from the one or more agent reservoir layers or portions **1212**.

(133) As shown in FIGS. **23-25**, in some embodiments, the agent reservoir dispenser portion **1211** of the patch device **1210** may include a dispenser layer **1216** extending over at least one reservoir layer **1212**. The reservoir layer **1212** is configured to absorb and retain the agent therein, and overlies the attachment layer **1214** in the thickness direction. The dispenser layer **1216** may overlie the reservoir layer **1212** in thickness direction, as shown in FIGS. **23-25**. The dispenser layer **1216** may comprise a plurality of solid portions and an array of a plurality of openings extending through a thickness thereof, and be configured to inhibit evaporation of the agent, and control a flow of the agent from the agent reservoir dispenser portion **1211** (and in particular the reservoir layer **1212**) upon the compression of the patch device **1210** in the thickness direction when the agent is contained within the at least one reservoir layer **1212**. The solid portions of the at least one dispenser layer **1216** and portions of the at least one reservoir layer **1212** underlying the plurality of openings of the at least one dispenser layer **1216** may define outer face **1220** of the patch device **1210** (when the protective liner is removed, if provided).

(134) The agent reservoir dispenser portion **1211** is configured to contain the volume of an agent. For example, an agent may be absorbed into the agent reservoir dispenser portion **1211** (e.g., the

agent reservoir dispenser portion **1211** may comprise an absorbent pad, layer or portion). As another example, the agent reservoir dispenser portion **1211** may form at least one cavity, opening or cell that contains an agent. The agent reservoir dispenser portion **1211** is also configured to dispense an agent at the dispensing surface portion **1220** to a user who compresses the dice **1210**, such as wiping across a portion of the dispensing surface portion **1220**. At least a portion of the agent reservoir dispenser portion **1211** thereby automatically controls the speed and duration of the release/flow of the agent at/to the outer dispensing surface portion **1220** (and thereby to a user on an on-demand basis). For example, the agent reservoir dispenser portion **1211** may be configured to draw or otherwise provide a portion of the volume of an agent at or to the dispensing surface portion **1220** such that when a user touches or wipes the dispensing surface portion **1220**, some of an agent transfers to the user.

(135) In some embodiments, the reservoir and dispensing functions or processes of the agent reservoir dispenser portion **1211** may be accomplished by a common layer or portion of the agent reservoir dispenser portion **1211**. In some other embodiments, the reservoir and dispensing functions or processes of the reservoir and dispensing functions or processes may be accomplished by differing layers or portions of the agent reservoir dispenser portion **1211**.

(136) As discussed above and shown in FIGS. 23-25, in some embodiments, the agent reservoir dispenser portion **1211** may comprise at least one reservoir layer or portion **1212** that is configured to absorb and retain the agent therein. In some embodiments, the at least one reservoir layer or portion **1212** may comprise a nonwoven absorbent fabric layer. For example, in one embodiment, the at least one reservoir layer **1212** may be formed of a fabric layer of non-woven polymer fibers, such as non-woven polyethylene and/or polypropylene fibers. In some embodiments, the at least one reservoir layer or portion **1212** may comprise a natural or synthetic non-woven fabric layer. The at least one reservoir layer **1212** may comprise one or more layers of polymer fibers, cotton fibers, silicone fibers, hydrogel or a combination thereof. In some embodiments, the at least one reservoir layer or portion **1212** may comprise one or more layers of a fabric, Gore-Tex, gauze, an absorbing gel, a polymer, paper, a foam or a combination thereof.

(137) In some embodiments, the at least one reservoir layer or portion **1212** may be formed of a (woven or non-woven) cloth or fabric (e.g., a cotton, nylon, polyester or the like layer/portion), Gore-Tex, gauze, absorbing gel (e.g., a hydrogel), flashspun high-density polyethylene (e.g., Tyvek), porous/filter paper, plastic film, foam, hydrocolloid, alginate, polysaccharide pastes, granules and/or beads, or a combination thereof. For example, in some embodiments the reservoir portion **1212** may comprise one or more layers of cotton, polyester, silicone, polyurethane, polyamide, polyethylene, hydrogel or a combination thereof. In some such embodiments, the reservoir portion **1212** may include a cotton fabric layer or portion, a nylon fabric layer or portion, a polyester fabric layer or portion, a flashspun high-density polyethylene fiber layer or portion, a hydrogel layer or portion, a flexible polyamide net coated with silicone layer or portion, a hydrogel layer or portion formed of hydrophilic polymers, or a combination thereof.

(138) In some embodiments, the at least one reservoir layer or portion **1212** may be configured to absorb and retain within the range of about 2 grams and about 50 grams of the agent, and/or have a detached agent capacity within the range of about 1,000 g/mm² and about 2,500 g/mm². In some embodiments, the at least one reservoir layer **1212** comprises an agent absorbency rate of at least 5 g/sec for at least the first 5 seconds of water contact. The at least one reservoir layer or portion **1212** can be configured such that when the agent is contained/absorbed therein, a compressive force acting in the thickness direction and applied to the outer dispensing surface **1220** of the patch device **1210** of at least 1 gram/mm² causes the agent to flow through from the at least one reservoir layer or portion **1212** and onto the outer dispensing surface **1220** (potentially through apertures in an outer dispenser layer **1216**, as discussed further below) and/or an onto an object at the outer dispensing surface **1220**.

(139) As discussed above and shown in FIGS. 23-25, in some embodiments, the agent reservoir

dispenser portion **1211** may comprise at least one dispenser layer or portion **1216** comprising a plurality of solid portions and an array of a plurality of openings or apertures extending through a thickness thereof, the at least one dispenser layer **1216** configured to inhibit evaporation of the agent, and control a flow of the agent from the at least one reservoir layer **12**, upon the compression of the patch device **1210** in the thickness direction when the agent is contained within the at least one reservoir layer.

(140) The at least one dispenser layer **1212** may comprise at least one perforated or micro porous film or layer. In some embodiments, the at least one dispenser layer **1212** comprises a sheet or layer of material that is impervious to the agent and/or impervious to air. In some embodiments, the at least one dispenser layer **1212** comprises a polymer layer. In some embodiments, the at least one dispenser layer **1212** comprises at least one polyethylene layer, polypropylene layer, styrene layer, polyetheretherketone layer, acrylic layer, polyvinyl chloride layer, polyurethane layer, Teflon (Polytetrafluoroethylene) layer, syrlin layer or a combination thereof.

(141) In some embodiments, the solid portions of the at least one dispenser layer **1212** may comprise within the range of about 1210% and about 65% of the total area of the outer dispensing face/side **1220** of the patch device **1210**. In some embodiments, the plurality of openings of the at least one dispenser layer **1212** comprise a total area within the range of about 50 mm² and about 12300 mm² at the outer dispensing face/side **1220** of the patch device **1210**. In some embodiments, each of the plurality of openings of the at least one dispenser layer **1212** comprise a total area within the range of about 0.05 mm² and about 0.3 mm² at the outer dispensing face/side **1220** of the patch device **1210**.

(142) At least the dispensing portion **1212** of the agent reservoir dispenser portion **1211** may be configured to control the amount and/or rate at which an agent moves or is drawn therethrough (e.g., via capillary action) and to the dispensing surface portion **1220**. The agent reservoir dispenser portion **1211** is thereby configured to meter/control the release or dispensing of an agent to/from/at the dispensing surface portion **1220**. For example, at least one of the pore/perforation size, pore/perforation count/number, density and thickness of the at least one dispenser layer **12**, and capillary action of the agent reservoir dispenser portion **1211**, may be configured to control the amount and/or rate at which an agent moves or is drawn to and through the at least one reservoir layer/portion **1212** and the at least one dispenser layer **1216** to the dispensing surface portion **1220**. The agent reservoir dispenser portion **1211** may be configured such that a particular dosage of an agent flows through the agent reservoir dispenser portion **1211** and the dispensing surface portion **1220** when a certain pressure (e.g., a certain magnitude, area, direction, etc.) is applied thereto by a user such that the particular dosage of an agent is transferred to the dispensing surface portion **1220** (and thus a user or surface applying the compression/pressure) thereby.

(143) In some embodiments, the patch device **1210** (formed of the agent reservoir dispenser portion **1211** (e.g., comprising the at least one reservoir layer/portion **1212** and the at least one dispenser layer/portion **1216**), the at least one backer layer/portion **1240** and at least one attachment layer/portion **1214**) being saturated with a liquid or gelatinous agent, such as those disclosed herein, is configured such that the agent is available/dispensable at the dispensing surface portion **1220** via touching or swiping of the dispensing surface portion **1220** by a user for at least 2 hours, at least 3 hours, at least 4 hours, at least 5 hour or at least 6 hours after the dispensing surface portion **1220** is initially exposed to air. In some embodiments, the patch device **1210** is configured such that when a liquid or gelatinous agent, such as those disclosed herein, is absorbed within the at least one reservoir layer **1212**, the patch device **1210** is configured such that no more than 5 grams of the agent evaporates over 1.5 hours in an ambient environment of non-moving/stagnant air at 1220 degrees Celsius.

(144) The agent may be any biocompatible disinfectant (i.e., safe and effective for use with humans, such as on human skin), such as any topical disinfectant effective in killing and/or preventing reproduction of disease causing pathogens (such as viruses and bacteria, for example)

when an agent and the pathogens physically interact. An agent may be effective on disinfecting a person's skin and in addition to the surface of an inanimate object (such as a surface comprising plastic, metal, glass, paper, cardboard, etc.). For example, an agent may comprise an alcohol sanitizer and/or a non-alcohol sanitizer. In some embodiments, the agent may comprise a disinfectant comprising ethyl, isopropyl, ethanol (ethyl alcohol), triclosan, triclocarban, benzalkonium chloride, benzethonium chloride or a combination thereof. In some embodiments, the agent may comprise a disinfectant comprising ethanol (ethyl alcohol). In some embodiments, the agent may comprise a dynamic viscosity within the range of about 4 (Pa.Math.s)(m²/s) and about 1215 (Pa.Math.s)(m²/s) at 1220 degrees Celsius. In some embodiments, the agent may comprise a medicant or vitamin, insecticide, fragrance, food product, cleaning product, paint and/or oil.

(145) In some embodiments, an agent comprises ethyl, isopropyl, ethanol (ethyl alcohol), triclosan, triclocarban, benzalkonium chloride, benzethonium chloride or a combination thereof. In some embodiments, an agent comprises 1,2-hexanediol, ammonium bicarbonate, ammonium carbonate, benzalkonium chloride, benzalkonium chloride, chlorine dioxide, citric acid, dodecylbenzenesulfonic acid, ethanol, ethyl, glutaraldehyde, glycolic acid, hydrochloric acid, hypochlorous acid, isopropyl, isopropanol, lactic acid, L-lactic acid, octanoic acid, peroxyacetic acid, peroxyoctanoic acid, phenolic, potassium peroxymonosulfate, quaternary ammonium, silver, silver ion, sodium carbonate, sodium carbonate peroxyhydrate, sodium chloride, sodium chlorite, sodium dichloroisocyanurate, sodium dichloroisocyanurate dihydrate, sodium dichloro-S-triazinetriene, sodium hypochlorite, thymol, triethylene glycol, triclosan, triclocarban, alcohol (e.g., at least 60% by volume), aloe gel, vinegar, an essential oil, aromatherapy compound, or a combination thereof. In some embodiments, an agent may comprise at least one essential oil, such as geranium, lavender, sweet marjoram, neroli, palmarosa, peppermint, petitgrain, rose, tea tree, thyme, linalool oil or a combination thereof. In some embodiments, an agent may be in liquid or gel form. In some embodiments, an agent may comprise a solution and/or a suspension, and may include at least solid disinfectants.

(146) It is also specifically disclosed herein that although embodiments of the on-demand dispensing devices (and related methods) of the present disclosure are described with respect to containing and dispensing a disinfectant (i.e., on-demand disinfectant dispensing devices), the devices may equally be employed to dispense any other solid, liquid or gel agent. For example, the devices may contain and be configured to dispense any pleasant or foul odorous and/or tasteful material (e.g., perfume, attractant/detractant-repellant (e.g., bug or insect repellent, etc.). As another example, the devices may contain and be configured to dispense a skin lotion (e.g., moisturizer, sunscreen, etc.), antiperspirant/deodorant, medication/medicine, lubricant, friction-enhancing material (e.g., a sticky or gritty material), any other biocompatible material, biohazard material or a combination thereof. In some such embodiments, the medication/medicine may be a medicant, a vitamin (vitamin C, B12, etc.) or supplement (e.g., caffeine, nicotine, etc.), a cannabinoid (e.g., cannabidiol (CBD)), delta-9-tetrahydrocannabinol (THC) or a food product (e.g., sugar, candy, etc.). As a further example, the devices may contain and be configured to dispense a paint. As another example, the devices may contain and be configured to dispense a cleaning product. As another example, the devices may contain and be configured to dispense a food product or foodstuff.

(147) The layers or portions of the patch device **1210** may be coupled together via any means, such as any mechanical and/or chemical mode or method. In some embodiments, the layers or portions of the patch device **1210** are adhered to each other. In some embodiments, the layers or portions of the patch device **1210** are bonded to each other. In some such embodiments, the layers or portions of the patch device **1210** are bonded to each other via the materials making up the layers or portions. For example, in some embodiments, at least some of the adjacent layers or portions of the patch device **1210** may be bonded to each other via the layers or portions being heated above their

melting or softening points and becoming bonded together. In some such embodiments, the at least one reservoir layer **1212** and the at least one dispenser layer **1216**, and/or the at least one reservoir layer **1212** and the at least one backer layer **1240**, may be heat, radio-frequency and/or ultrasonic welded together. In some embodiments, if the at least one reservoir layer **12**, the at least one dispenser layer **1216** and/or the at least one backer layer **1240** are formed of more than one overlapping layers, such layers may be bonded together.

(148) As shown in FIGS. **26-28**, in some embodiments, the patch device **1210** may be bonded or adhered together such that an outer peripheral portion **60** is compressed together as compared to an interior or central portion of the patch device **1210**. The outer peripheral portion **60** may thereby define a total/maximum thickness **T1** that is less than that of the interior or central portion of the patch device **1210**. In some embodiments, the outer peripheral portion **60** may be formed via at least some of the layers/portions of the patch device **1210** being compressed and bonded together, such as via heat, radio-frequency and/or ultrasonic welded together.

(149) In some embodiments, the patch device **1210** may define a total/maximum thickness within the range of about 0.05 mm and about 3 mm. In some embodiments, the outer peripheral portion **60** may thereby define a total/maximum thickness **T1** that less than 75%, such as about 50%, that of the interior or central portion of the patch device **1210**.

(150) The periphery of the patch device **1210** may define any shape and size. For example, as shown in FIGS. **26** and **27**, in one exemplary embodiment the patch device **1210** may define an oval or oblong shape such that a length of the patch device **1210** is greater than a width of the patch device **1210** (such as a width of within the range of 1 inch to 4 inches, and a length of 1.5 to 1210 inches). In some other exemplary embodiments (not shown), the patch device **1210** may define a circular shape (e.g., with a diameter within the range of 1 inch to 4 inches, or within the range of 1 inch to 2.5 inches).

(151) As shown in FIGS. **22-28**, a kit, system or device according to the present disclosure may include one patch device **1210**, or may include a plurality of patch devices **1210** as shown in FIGS. **29** and **30**. Further, as noted above, the one or more patch devices **1210** may or may not include an agent incorporated into the patch device **1210**. For example, the one or more patch devices **1210** may be entirely void of an agent to be dispensed, or at least void of an agent being absorbed in the reservoir dispenser portion **1211** (e.g., absorbed in the at least one reservoir layer **12**).

(152) As shown in FIG. **29**, in some embodiments, a kit, system or device a kit, system or device according to the present disclosure may include a plurality of the patch devices **1210** provided or coupled to a substrate or carrier material **1262**. In some embodiments, the plurality of the patch devices **1210** may be coupled to the substrate or carrier material **1262** via the attachment portion **1214** thereof (e.g., an adhesive layer). In some other embodiments, the plurality of the patch devices **1210** may be coupled to the substrate or carrier material **1262** via an additional adhesive, member or mechanism.

(153) As shown in FIG. **30**, in some embodiments a kit, system or device according to the present disclosure may include one or more of the patch devices **1210** (e.g., a plurality of the patch devices **1210**) and a container **1266** of an agent to be dispensed by the one or more patch devices **1210**. For example, as disclosed above, the agent may be a disinfectant/sanitizer. In such embodiments, the one or more patch devices **1210** can be provided void of the agent, and the agent can be applied to a patch device **1210** when an on-demand dispensing supply of the agent is desired. For example, as shown in FIG. **31**, a “dry” patch device **1210** devoid of the agent may be attached or coupled to a surface, such as adhered to a user, and the container **1266** of the agent may be utilized by the user to apply a volume of the agent to the dispensing surface **1220** so that the agent is absorbed into the reservoir dispenser portion **1211** (e.g., absorbed into the at least one reservoir layer **1212**).

(154) The container **1266** can thereby be separate and distinct from the one or more patch devices **1210**, and the one or more patch devices **1210** can be provided and stored prior to use with the agent reservoir dispenser portion **1211** (and the other portions) of the one or more patch devices

1210 being void of the agent, such as the agent not being absorbed in the at least one reservoir layer **1212** thereof.

(155) In an alternative embodiment, one or more containers **1266** of an agent may be integrated into each of the one or more patch devices **1210** such that the agent is contained and not absorbed in the at least one reservoir layer **12**, but configured such that release of the agent from the container causes the agent to flow into/be absorbed by the agent reservoir dispenser portion **1211** (e.g., the at least one reservoir layer **1212**). For example, the one or more containers **1266** of an agent may be embedded within, or positioned adjacent or near, the agent reservoir dispenser portion **1211** (e.g., the at least one reservoir layer **1212**) of a patch device **1210**. As also described above, in such embodiments, the one or more containers **1266** may be manually breakable or openable so that the agent can be selectively manually released from the one or more containers **1266**.

(156) After a volume of the agent is provided on the patch device **1210** via the container **1266**, and the agent (e.g., at least a majority thereof) is absorbed into the agent reservoir dispenser portion **1211** (e.g., into the at least one reservoir layer **1212**), a user may compress the patch device **1210** in the thickness direction to force a certain dose or volume of the agent from the agent reservoir dispenser portion **1211** and to the user at the dispensing surface **1220**. For example, as shown in FIG. 32, a user may compress and “crunch” a device patch **1210** via a hand that the patch device **1210** is coupled to. It is noted such a motion/method could also break an encapsulated agent contained within/on the patch device **1210** to release the agent into the agent reservoir dispenser portion **1211**, and also dispense the agent.

(157) As another example, as shown in FIG. 33, a user may swipe the dispensing surface **1220** to compress a length of the patch device **1210** in the thickness direction to force a certain dose or volume of the agent from the agent reservoir dispenser portion **1211** and to the user at the dispensing surface **1220**. In such a method, the patch device **1210** may be coupled to a surface (e.g., a portion of a user, such as a user's forearm, as an example) that is remote from a user's hand, and the user may use the hand to swipe the patch device **1210** and dispense a volume of the agent from the patch device **1210**.

(158) In some embodiments, the patch device **1210** may be configured such that it can be coupled to a user on a passive piece of clothing (e.g., hat, shirt, coat, pant, belt, shoe, scarf, glove, sock, etc.) or another inanimate object (sweatband, kinesiology/muscle tape, heat/cool pads, helmet, protective pad/brace/splint/cast, headphones, luggage, personal accessories, luggage, wallet, hand bag/purse, athletic equipment, etc.) that is configured to couple to (i.e., be worn or carried by) the user. The patch device **1210** may thereby be removably coupled to a passive portion of the user that is spaced from the point/portion of contact of the user that the user wishes to apply the agent to via touching of the dispensing surface portion **1220**. As noted above, the attachment portion **1214** may include an adhesive or mechanical connection mechanism that is configured to attach to a specific or general surface, such as to the clothing or another inanimate object on/coupled to the user. In use, the user can thereby removably couple the patch device **1210** to their clothing or another inanimate object on/coupled to the user on a passive portion of the user (such as but not limited to over the user's forearm, upper arm, chest, waist or thigh), and touch or wipe the dispensing surface portion **1220** with one or more of their hands when the user desires to apply the agent thereto (e.g., disinfect) their one or more of their hands (or another body portion or inanimate object touched by the user's one or more hand). When the user desires, the patch device **1210** can be removed from the clothing or another inanimate object on/coupled to the user (preferably without damaging the surface outer surface thereof).

(159) As also discussed above, in some embodiments, the attachment portion **1212** (and potentially the reservoir dispenser portion **1211**) may be configured such that the patch device **1210** is worn by a user directly on their skin. The attachment portion **1214** may thereby be configured to be biocompatible with a person's passive skin, and the patch device **1210** may be breathable or

otherwise resistant to causing the user to sweat beneath the device **1210**. For example, the patch device **1210** may be configured to have an “invisible” feel when attached to a user's skin. The patch device **1210** may thereby be removably coupled to a user's skin. In use, the user can thereby removably couple the patch device **1210** directly to their skin (such as but not limited to on the user's hand, forearm, upper arm or thigh), and touch or wipe the dispensing surface portion **1220** with one or more of their hands when the user desires to apply the agent (e.g., a disinfectant) to their one or more of their hands (or another body portion or inanimate object touched by the user's one or more hand). When the user desires, the patch device **1210** can be removed from the skin of the user (preferably without hurting, irritating or otherwise damaging the skin).

(160) In some exemplary embodiments, the patch device **1210** may be configured (e.g., shaped and sized) to removably couple to and extend over (e.g., cover) the palm and/or at least a portion of at least one finger of a hand of a user. As another example, in some embodiments, the patch device **1210** may be configured (e.g., shaped and sized) to removably couple to and extend over (e.g., cover) just a portion of the palm of a hand of a user, as shown in FIG. **32**. In some other exemplary embodiments, the patch device **1210** may be configured (e.g., shaped and sized) to removably couple to and extend over (e.g., cover) at least a portion of an interior side of a finger of a hand of a user. As another example, in some embodiments, the patch device **1210** may be configured (e.g., shaped and sized) to removably couple to and extend over (e.g., cover) just a portion of the forearm of an arm of a user, as shown in FIGS. **31** and **33**, for example. In some other exemplary embodiments, the patch device **1210** may be configured (e.g., shaped and sized) to removably couple to and extend over (e.g., cover) at least a portion of an elbow of an arm of a user.

(161) In yet another embodiment, the patch device **1210**, such as at least the attachment portion **1214**, may be configured to attach to an inanimate object (not shown) that is not worn or carried by a user. For example, the attachment portion **1214** may be configured to removably (or fixedly) attach to a handle, knob, switch, arm rest, seat, steering wheel, transmission/shift lever, athletic equipment, medical equipment, office equipment, culinary equipment, military/defense equipment, packaging (e.g., a shipping or product packaging), furniture, pet product, or any other item or surface that is communal (i.e., likely to be touched by more than one person) or that is positioned within/near a communal space area, surface or item.

(162) In some embodiments, the patch device **1210** may be configured such that the appearance of a portion of the patch device **1210**, such as the dispensing surface portion **1220**, changes as the volume of an agent within the reservoir dispenser portion **1211**. In this way, the patch device **1210** may automatically visually and/or tactically indicate the particular volume of an agent within the reservoir dispenser portion **1211**, and thereby available to the user via the dispensing surface portion **1220**, at any particular time. It is noted that the patch device **1210** may be configured to variably change colors as the volume of an agent changes, or may only change colors once when the level of an agent is at least substantially depleted and/or the level available to a user is inadequate (to disinfect, for example). For example, the reservoir dispenser portion **1211** and/or an agent may be configured to change color with changes in the temperature, pH and/or dryness/wetness (e.g., liquid vs. solid form) thereof. As the volume of an agent within the reservoir dispenser portion **1211** decreases (such as from being dispensed via the dispensing surface portion **1220**, to a user and/or evaporating (or otherwise changing states), the temperature, pH and/or dryness/wetness (e.g., liquid/solid state) of the reservoir dispenser portion **1211** and/or an agent may change and cause a color change, such as with respect to a material/component/chemical/additive of or within the reservoir dispenser portion **1211** and/or an agent. In some embodiment, the reservoir dispenser portion **1211** and/or an agent may be configured to change color with time, independently of the actual volume of an agent. For example, the reservoir dispenser portion **1211** and/or an agent may include a pigment, ink dye or the like that degrades or absorbs over time such that the color thereof changes over time. In this way, the color of the patch device **1210** can indicate to a user how long the patch device **1210** has been in use, and

thereby an indication of the potential state of the volume of an agent (e.g., an agent may evaporate over time).

(163) As another example, the patch device **1210** may be configured such that the size, shape, surface texture and/or other physical dimension/aspect of the patch device **1210** changes as the volume of an agent within the reservoir dispenser portion **1211** decreases to provide a tactile indication of the level thereof. For example, the dispensing surface portion **1220** may include raised bumps or the like that flatten/shorten as the volume of an agent within the reservoir dispenser portion **1211** decreases.

(164) Another exemplary on-demand dispensing device **1310** that is configured as a pocket patch device **1310** is shown in FIGS. **34-37**. The device **1310** of FIGS. **34-37** is substantially similar to the device **10** of FIG. **1-7**, the device **110** of FIG. **8**, the device **210** of FIGS. **9** and **10**, the device **310** of FIG. **11**, the device **410** of FIG. **12**, the device **510** of FIGS. **13-15**, the device **610** of FIG. **16**, the device **710** of FIG. **17**, the device **810** of FIG. **18**, the device **910** of FIG. **19**, the device **1010** of FIGS. **20** and **21**, the device **1110** of FIG. **22** and the device **1210** of FIGS. **23-33**, and therefore like reference numerals preceded with “12” are used to indicate like components, aspects, functions, processes or functions, and the description above directed to thereto equally applies, and is not repeated for brevity and clarity purposes.

(165) As shown in FIGS. **34-37**, the device **1310** comprises a flexible agent-impervious pocket **1370** comprising a front portion or face **1374**, a back portion or face **1376**, a bottom portion **1375**, a top portion **1376**, lateral side portions **1377** that form an agent-impervious interior cavity or pocket **1375** between inner sides of the front and back faces, the lateral side portions **1377** and above the bottom portion **1375**. The interior cavity **1375** is thereby closed at the bottom portion **1375** and the lateral side portions **1377** (and at the front and back sides **1374**, **172**), as shown in FIGS. **34-37**. As also shown in FIGS. **34-37** the agent-impervious pocket **1370** is open or openable at a top or upper end portion **1376** on the pocket **1370**. The open top end **1376** thereby provides access into the interior cavity **1375**.

(166) The pocket **1370** may be impervious to an agent such that the agent (e.g., a liquid or gelatinous agent) contained within the interior cavity **1375** (as explained further below) is unable to flow or otherwise pass through the front portion **1374**, the back portion **1376**, the bottom portion **1375** and the lateral side portions **1377**. In some embodiments, the pocket **1370** may be impervious to air such that air is unable to pass into the interior cavity **1375** (or pass therefrom) through the front portion **1374**, the back portion **1376**, the bottom portion **1375** and the lateral side portions **1377**.

(167) The pocket **1370** may be formed from or comprise the same or similar materials as the backer layer **1340** and/or dispenser layer **1316** as disclosed herein. For example, in some embodiments, the pocket **1370** (e.g., the front portion **1374**, the back portion **1376**, the bottom portion **1375** and the lateral side portions **1377**) may be formed a solid sheet of material. In some embodiments, the pocket **1370** may be formed of or comprise a polymer layer or film. In some embodiments, the pocket **1370** may be formed of or comprise at least one polyethylene layer, polypropylene layer, styrene layer, polyetheretherketone layer, acrylic layer, polyvinyl chloride layer, polyurethane layer, Teflon (Polytetrafluoroethylene) layer, syrlin layer or a combination thereof.

(168) In some embodiments, the front portion or face **1374** and/or the back portion or face **1376** may be the backer layer **1340** of the device **10** described herein. In such embodiments, an additional backer layer **1340**, or the two backer layers **1340**, **1340**, may be coupled together (e.g., bonded) at their lateral sides and bottom end portions to form the flexible agent-impervious pocket **1370**.

(169) As shown in FIGS. **34-37**, at least one reservoir dispenser portion or layer **1311** may be coupled within the interior cavity **1375** such that the dispensing surface portion **120** is exposed to the interior of the interior cavity **1375**. For example, a reservoir dispenser portion **1311** may be coupled to an inner side of the front portion **1374** within the interior cavity **1375**, a reservoir

dispenser portion **1311** may be coupled to an inner side of the back portion **1372** within the interior cavity **1375**, or a first reservoir dispenser portion **1311** may be coupled to the inner side of the front portion **1374** within the interior cavity **1375** and a second reservoir dispenser portion **1311** may be coupled to the inner side of the back portion **1372** within the interior cavity **1375**. It is noted that the reservoir dispenser portion **1311** may be coupled to the back portion **1372** and/or the front portion **1374** via an adhesive, bonded thereto and/or a mechanical attachment. In some embodiments, a backer layer may be positioned/coupled between the reservoir dispenser portion **1311** and a respective one of the back portion **1372** or the front portion **1374**.

(170) As discussed in detail above, the reservoir dispenser layer **1311** is configured to absorb and retain a liquid or gelatinous agent therein, and control a flow of the agent therefrom upon/via compression of the reservoir dispenser layer **1311** retained/absorbed therein. As also discussed above, the reservoir dispenser portion **1311** may initially be void of the agent, or at least void of the agent being absorbed therein, and applied from a separate and distinct container. As another example, the reservoir dispenser portion **1311** may not contain an agent absorbed therein, but the pocket patch device **1310** may contain an encapsulated or container of the agent that can be manually broken or otherwise opened to allow the agent to flow to and be absorbed by the reservoir dispenser portion.

(171) The pocket patch device **1310** may be configured such that the interior cavity **1375** is sized and shaped to allow at least one finger of a user to extend into the interior cavity **1375** and engage the dispensing surface portion **1320** to compress the reservoir dispenser layer **1311** and dispense agent therefrom and onto the user, as shown in FIGS. 37A-C. As also shown in FIGS. 37A-C, in some embodiments the pocket patch device **1310** may be configured such that the interior cavity **1375** is sized and shaped to allow multiple fingers, or whole hand, of a user to extend into the interior cavity **1375** and engage the dispensing surface portion **1320** to compress the reservoir dispenser layer **1311** and dispense agent therefrom and onto the user's fingers/hand.

(172) As shown in FIGS. 35 and 36, the outer side of the pocket **1370** may include the attachment layer or portion **1314** (and potentially a liner layer protecting/covering the attachment layer or portion **114**) configured to removably couple the pocket patch device **1310** to a surface, as described above. In some embodiments, the outer side or face of the back portion **1372** may include the attachment portion **1314** coupled thereto, as shown in FIGS. 35 and 36. In some embodiments, the outer side or face of the front portion **1374** may include the attachment portion **114** coupled. In some embodiments, the outer side or face of the back portion **1372** may include a first attachment portion **1314** coupled thereto, and the outer side or face of the front portion **1374** may include a second attachment portion **1314** coupled thereto. As described above, the attachment portion(s) **1314** may be an adhesive or a mechanical mechanism configured to removably couple the pocket patch device **1310** to a surface, for example.

(173) In some embodiments, the top or upper end portion **1376** of the pocket **1370** may initially be closed (and potentially sealed), and be configured to be opened or unsealed. For example, as shown in FIG. 38, the top end portion **1376** of the pocket **1370** may include or comprise a closed construct. The closed construct may be sealed, and be configured to be openable and closable, or just openable, such that the top end portion **1376** becomes open to the interior cavity **1375**.

(174) As shown in FIG. 38, in some embodiments, the closed construct **1382** may include an openable and closable closure **1384**. For example, the closure **1384** may be a peel-and-stick closure or a zipper closure (single or double, for example) that includes mating hooked channels or a mating hooked channel and hooked male member. The closure **1384** may allow for selective manual opening and closing/sealing of the top end portion **1376** for selective access to the interior cavity **1375**. The closure **1384** may prevent an agent and/or air from flowing through the top end portion **1376** to/from the interior cavity **1375**.

(175) In some embodiments, as shown in FIG. 38, the top end portion **1376** of the pocket **1370** may have a seal **1380** at an end portion thereof that seals off the top end portion **1376** and access to/from

the interior cavity **1375**. As also shown in FIG. **38**, in some such embodiments the top end portion **1376** may further comprise an unsealed portion **1382** positioned between the seal **1380** and the interior cavity **1375**. The unsealed portion **1382** may be configured to be cut, broken, torn or otherwise disconnected such that the seal can be selectively separated from the pocket **1370** to open the top end portion **1376** and provide access to/from the interior cavity **1375**. It is noted that the closure **1384**, the seal **1380** and the unsealed portion **1382** may all be provided at the top end portion **1376**.

(176) It is to be understood that the above description is intended to be illustrative, and not restrictive. For example, the above-described examples (and/or aspects thereof) may be used in combination with each other. In addition, many modifications may be made to adapt a particular situation or material to the teachings of the various examples without departing from their scope. While dimensions and types of materials may be described herein, they are intended to define parameters of some of the various examples, and they are by no means limiting to all examples and are merely exemplary. Many other examples will be apparent to those of skill in the art upon reviewing the above description. The scope of the various examples should, therefore, be determined with reference to the claims included herein, along with the full scope of equivalents to which such claims are entitled.

(177) As used herein, the terms “including” and “in which” are used as the plain-English equivalents of the respective terms “comprising” and “wherein.” Moreover, as used herein, the terms “first,” “second,” and “third,” etc. are used merely as reference labels, and are not intended to impose numerical, structural or other requirements. Forms of term “based on” herein encompass relationships where an element is partially based on as well as relationships where an element is entirely based on. Forms of the term “defined” encompass relationships where an element is partially defined as well as relationships where an element is entirely defined. Further, the limitations of the claims included herein are not written in means-plus-function format and are not intended to be interpreted based on 35 U.S.C. § 112, sixth paragraph, unless and until such claim limitations expressly use the phrase “means for” followed by a statement of function cavity of further structure. It is to be understood that not necessarily all such objects or advantages described above may be achieved in accordance with any particular example. Thus, for example, those skilled in the art will recognize that the systems and methods described herein may be embodied or carried out in a manner that achieves or optimizes one advantage or group of advantages as taught herein without necessarily achieving other objects or advantages as may be taught or suggested herein.

(178) While the disclosure has been described in detail in connection with only a limited number of examples, it should be readily understood that the disclosure is not limited to such disclosed examples. Rather, this disclosure can be modified to incorporate any number of variations, alterations, substitutions or equivalent arrangements not heretofore described, but which are commensurate with the spirit and scope of the disclosure. Additionally, while various examples have been described, it is to be understood that aspects of the disclosure may include only one example or some of the described examples. Also, while some disclosures are described as having a certain number of elements, it will be understood that the examples can be practiced with less than or greater than the certain number of elements.

(179) It should be appreciated that all combinations of the foregoing concepts and additional concepts discussed in greater detail below (provided such concepts are not mutually inconsistent) are contemplated as being part of the inventive subject matter disclosed herein. In particular, all combinations of claimed subject matter appearing at the end of this disclosure are contemplated as being part of the inventive subject matter disclosed herein.

Claims

1. An on-demand liquid or gelatinous agent dispensing kit, comprising: a container containing a volume of a liquid or gelatinous agent; and a flexible patch configured to contain, and provide on-demand dispensing of, the agent via compression of the patch in a thickness direction thereof, the patch comprising: an adhesive layer configured to removably couple the patch to a surface, the adhesive layer defining an inner face of the patch; at least one reservoir layer that is configured to absorb and retain the agent therein, the at least one reservoir layer overlying the adhesive layer in the thickness direction; at least one dispenser layer overlying the at least one reservoir layer in the thickness direction comprising a plurality of solid portions and an array of a plurality of openings extending through a thickness thereof, the at least one dispenser layer configured to inhibit evaporation of the agent, and control a flow of the agent from the at least one reservoir layer upon the compression of the patch in the thickness direction, when the agent is contained within the at least one reservoir layer; and at least one backer layer positioned between the adhesive layer and the at least one reservoir layer in the thickness direction, the at least one backer layer being substantially impervious to the agent, wherein the solid portions of the at least one dispenser layer and portions of the at least one reservoir layer underlying the plurality of openings of the at least one dispenser layer define an outer face of the patch, and wherein the at least one reservoir layer is void of the agent absorbed therein.
2. The kit according to claim 1, wherein the adhesive is a biocompatible adhesive.
3. The kit according to claim 1, wherein the patch further comprises an inner protective film layer extending over and removably coupled to the adhesive layer.
4. The kit according to claim 1, wherein the liquid or gelatinous agent is a disinfectant.
5. The kit according to claim 4, wherein the disinfectant comprises ethyl, isopropyl, ethanol (ethyl alcohol), triclosan, triclocarban, benzalkonium chloride, benzethonium chloride or a combination thereof.
6. The kit according to claim 5, wherein the disinfectant comprises a dynamic viscosity within the range of about 4 (Pa.Math.s) (m²/s) and about 15 (Pa.Math.s) (m²/s) at 20 degrees Celsius.
7. The kit according to claim 1, wherein the at least one backer layer is substantially impervious to the agent and to air, and wherein the at least one backer layer comprises a solid sheet of material.
8. The kit according to claim 1, wherein the at least one dispenser layer comprises a sheet of material that is impervious to the agent and air, and wherein the at least one dispenser layer comprises a polymer layer.
9. The kit according to claim 1, wherein the solid portions of the at least one dispenser layer comprise within the range of about 10% and about 65% of the total area of the outer face, wherein the plurality of openings of the at least one dispenser layer comprise an average total area within the range of about 50 mm.sup.2 and about 300 mm.sup.2 at the outer face, and wherein each of the plurality of openings of the at least one dispenser layer comprise a total area within the range of about 0.05 mm.sup.2 and about 0.3 mm.sup.2 at the outer face.
10. The kit according to claim 1, wherein the at least one reservoir layer comprises one or more layers of polymer fibers, cotton fibers, silicone fibers, hydrogel or a combination thereof.
11. The kit according to claim 10, wherein the at least one reservoir layer comprises a fabric layer of non-woven polyethylene fibers, polypropylene fibers or a combination thereof.
12. The kit according to claim 1, wherein the at least one reservoir layer is configured to absorb and retain within the range of about 2 grams and about 50 grams of the agent, wherein the at least one reservoir layer comprises a detached agent capacity within the range of about 1,000 g/mm.sup.2 and about 2,500 g/mm.sup.2, and wherein the at least one reservoir layer comprises an agent absorbency rate of at least 5 g/sec for at least the first 5 seconds of water contact.
13. The kit according to claim 1, wherein, when the agent is contained within the at least one reservoir layer, the patch is configured such that a compressive force acting in the thickness direction and applied to the outer surface thereof of at least 1 gram/mm.sup.2 causes the agent to

- flow through the plurality of apertures and onto the outer face and/or an object at the outer face.
14. The kit according to claim 1, wherein an inner portion of the patch defines a first maximum thickness, and a peripheral edge portion of the patch extending about the inner portion and defining an outer extent of the patch defines a second thickness that is less than the first thickness, wherein the peripheral edge portion of the patch defining the outer extent of the patch comprises the at least one reservoir layer, the at least one dispenser layer and the at least one backer layer being bonded together.
15. The kit according to claim 1, wherein, when the agent is contained within the at least one reservoir layer, the patch is configured such that no more than 5 grams of the agent evaporates over 1.5 hours in an ambient environment of non-moving air at 20 degrees Celsius.
16. The kit according to claim 1, wherein the adhesive layer on the outer side of the front face comprises an acrylic-based pressure-sensitive adhesive.
17. The kit according to claim 1, wherein the container is separate and distinct from the flexible patch.
18. The kit according to claim 1, wherein the container is integrated within, or coupled to, the flexible patch.
19. The kit according to claim 18, wherein the container is a manually breakable shell or envelope that is contained within the flexible patch.
20. The kit according to claim 19, wherein the manually breakable shell or envelope is a manually breakable polymer shell or container.
21. The kit according to claim 19, wherein the agent is a disinfectant.
22. The kit according to claim 21, wherein the disinfectant is a biocompatible disinfectant.
23. The kit according to claim 21, wherein the disinfectant comprises ethyl, isopropyl, ethanol (ethyl alcohol), triclosan, triclocarban, benzalkonium chloride, benzethonium chloride or a combination thereof.
24. The kit according to claim 23, wherein the disinfectant comprises a dynamic viscosity within the range of about 4 (Pa.Math.s) (m²/s) and about 15 (Pa.Math.s) (m²/s) at 20 degrees Celsius.
25. The kit according to claim 23, wherein the at least one backer layer is substantially impervious to the agent, and wherein the at least one backer layer comprises a solid sheet of material.
26. The kit according to claim 25, wherein the at least one reservoir layer comprises one or more layers of polymer fibers, cotton fibers, silicone fibers, hydrogel or a combination thereof.
27. The kit according to claim 25, wherein the at least one reservoir layer comprises a fabric layer of non-woven polyethylene fibers, polypropylene fibers or a combination thereof.
28. The kit according to claim 25, wherein the at least one backer layer is substantially impervious to air.
29. The kit according to claim 19, wherein the manually breakable shell or envelope is positioned adjacent to the at least one reservoir layer.
30. The kit according to claim 19, wherein the agent is a perfume, insect repellent, lotion, antiperspirant, lubricant, medicant, vitamin, cannabinoid or food product.
31. The kit according to claim 1, wherein the inner face and the outer face are substantially opposing faces of the patch in the thickness direction.
32. The kit according to claim 1, wherein the container is positioned within the flexible patch.
33. The kit according to claim 32, wherein the container is a manually breakable.
34. The kit according to claim 1, wherein the agent is a perfume, insect repellent, lotion, antiperspirant, lubricant, medicant, vitamin, cannabinoid or food product.
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