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(54) **GARMENT PERMITTING ENHANCED ACCESSIBILITY TO MEDICAMENT INJECTION SITES**

(76) Inventor: **Laurie E. McLeod**, Middleton, WI (US)

Correspondence Address:
**BOYLE FREDRICKSON S.C.**
**840 North Plankinton Avenue**
**MILWAUKEE, WI 53203**

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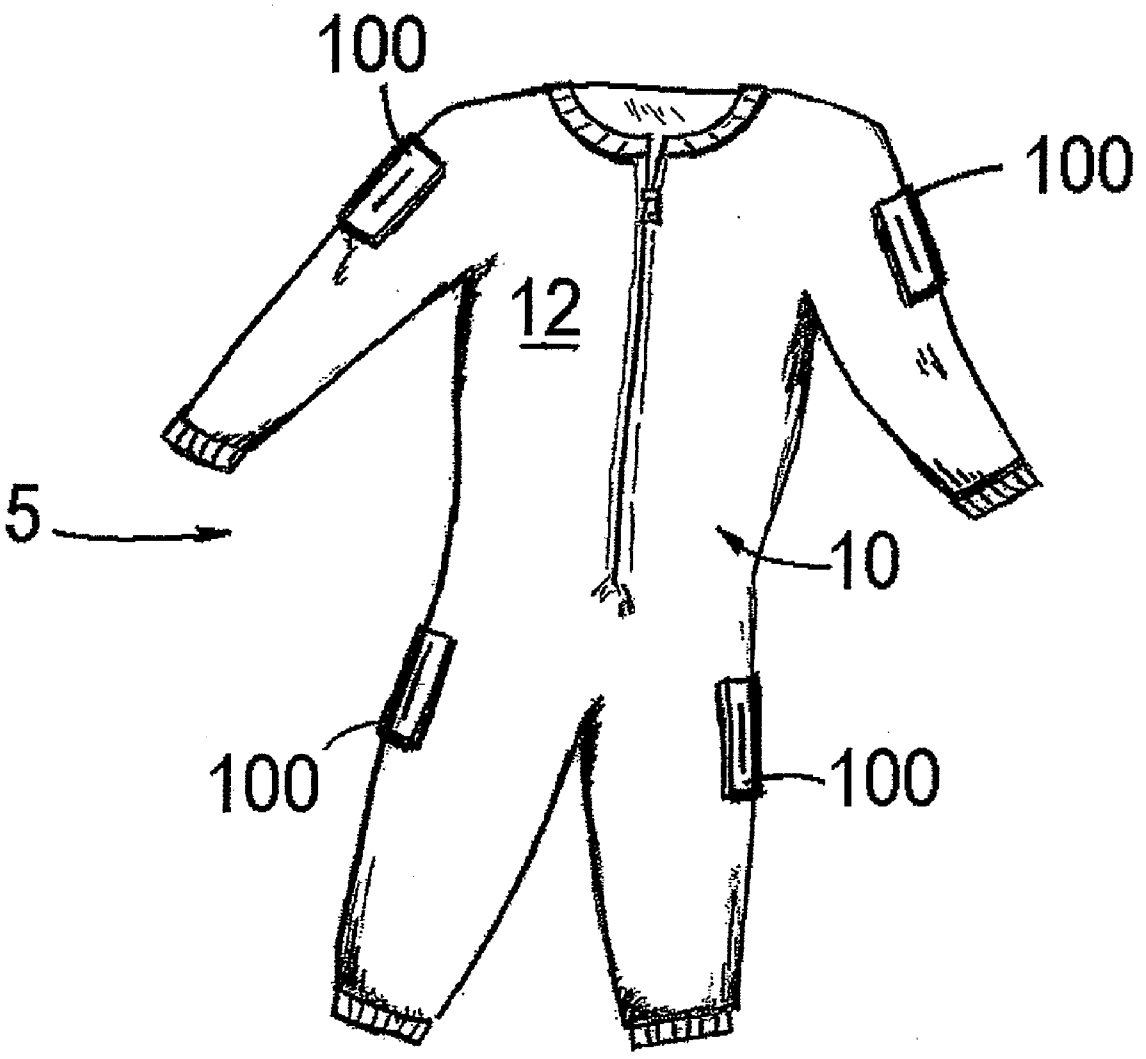
(57) **ABSTRACT**

Garments are provided that permit easy accessibility to medicament injection sites, or key zones, of the wearer. Each of the garments has multiple access slots which overlie respective injection sites, e.g., arms, thighs, abdomen, and/or other body parts which tend to accumulate subcutaneous fat, making them suitable as injection sites. Each of the access slots has a base portion and a corresponding flap portion. Openings are defined through the access slots, between the base and flap portions, and provide access to the skin of the wearer at the respective injection sites. The access slots can be incorporated into the garment in a visually inconspicuous manner by providing them on or within covers that replicate the appearance of, e.g., pockets, patches, or other structures concealing their appearance.



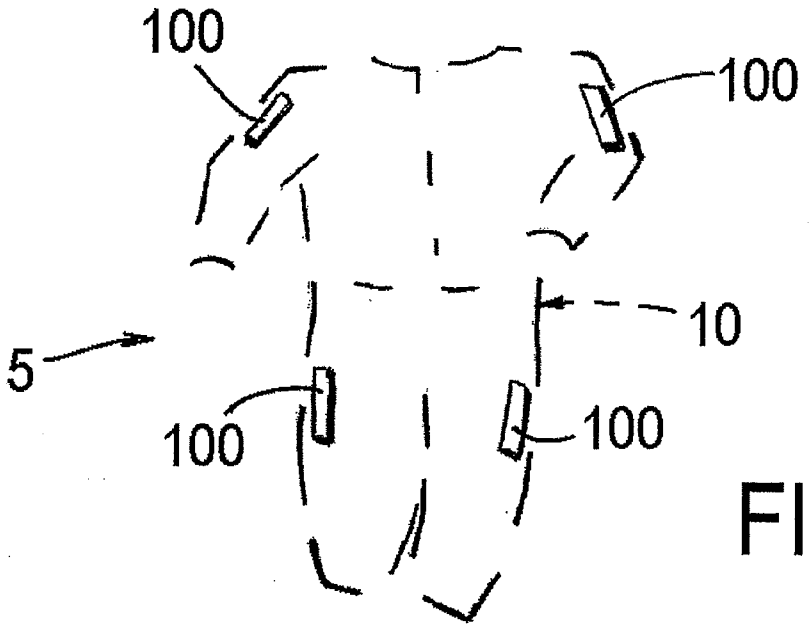



FIG.1

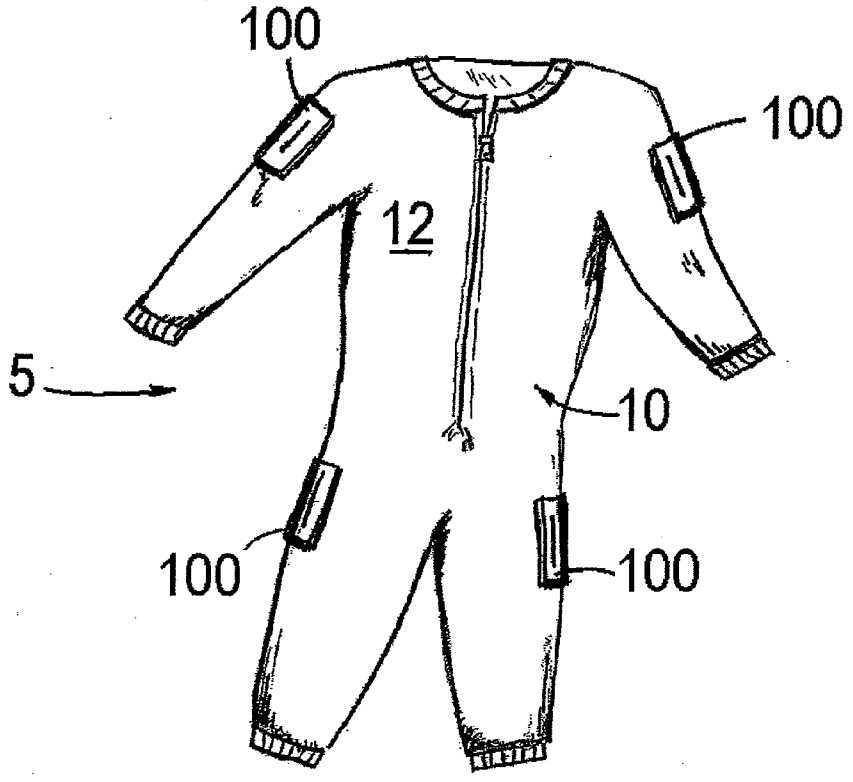



FIG. 2

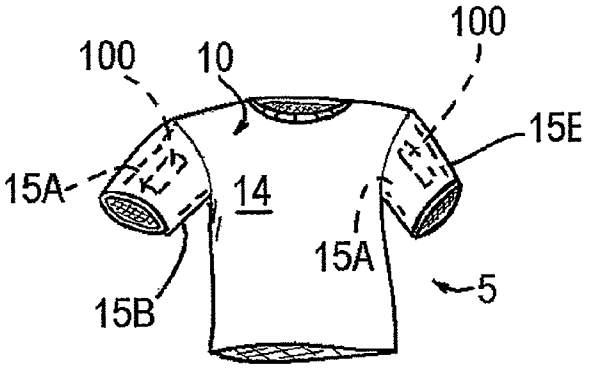



FIG. 3

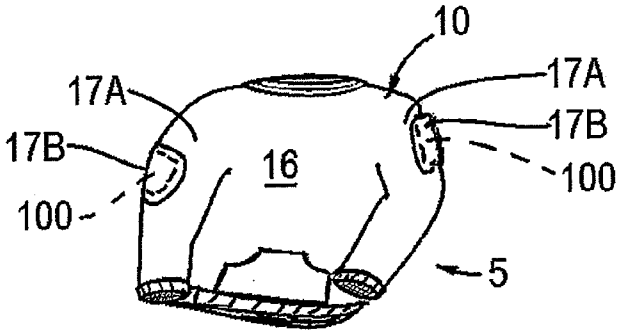



FIG. 4

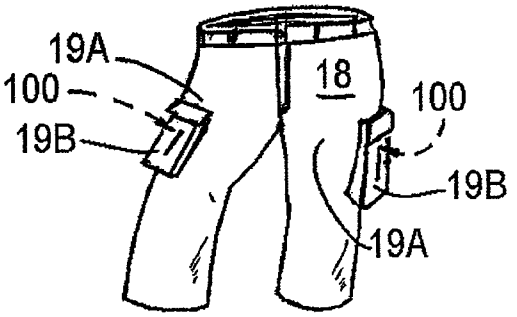



FIG. 5

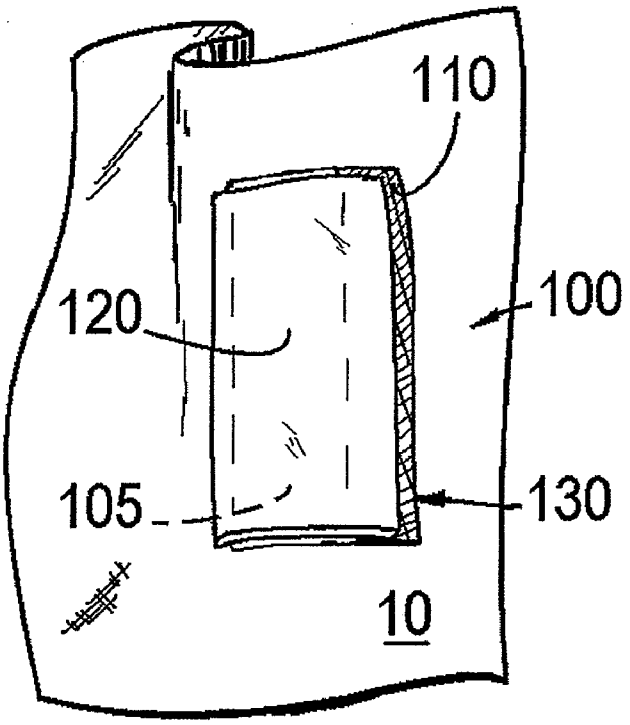



FIG. 6

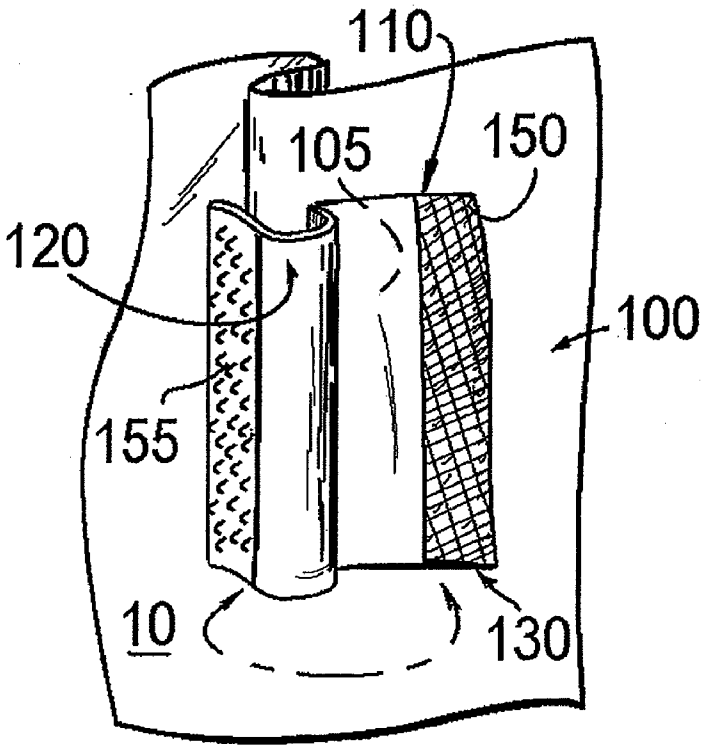



FIG. 7

# GARMENT PERMITTING ENHANCED ACCESSIBILITY TO MEDICAMENT INJECTION SITES

## CROSS-REFERENCE TO RELATED APPLICATIONS

**[0001]** This application claims priority from U.S. Provisional Patent Application Ser. No. 60/828,498, filed on Oct. 6, 2006, which is expressly incorporated by reference herein, in its entirety.

## BACKGROUND OF THE INVENTION

**[0002]** 1. Field of the Invention

**[0003]** The invention relates to clothing and, more particularly, to improvements in clothing that provide quick and easy access to the skin of a wearer's body to administer medicine.

**[0004]** 2. Discussion of the Related Art

**[0005]** According to recent estimates, approximately seven percent of the United States population has diabetes. Approximately 150,000 children presently have diabetes with more than 13,000 children diagnosed with the disease each year. Type 2 diabetes is the most common type of diabetes and can usually be controlled through diet and exercise. However, five to ten percent of all people with diabetes have Type 1 diabetes, a lifelong disease that develops when the pancreas stops producing insulin. Type 1 diabetes can develop at any age; however, it usually develops in children and young adults, which is why it used to be called juvenile diabetes. It has also been called insulin-dependent diabetes because insulin injections must be taken daily to supply the body with insulin.

**[0006]** When a child is diagnosed with diabetes, a parent or guardian must assume the responsibility for monitoring and controlling the child's blood sugar levels. Therefore, the caregivers of young children and toddlers with Type 1 diabetes must administer the injections to deliver the insulin. Insulin injections are generally administered to the body in subcutaneous fat zones, such as the arms, thighs or abdomen, also known as "key zones."

**[0007]** One method or strategy of accessing a child's key zones to administer insulin via needle injection is to remove all clothing by the key zones. This method is traumatic for both parent and a child. The requirement to remove clothing can also be tedious and difficult, especially at night when a child might be sleepy or groggy and difficult to move around. The removal of clothing during the day can also be disruptive and embarrassing depending on where an individual is at the time of a needed insulin injection.

**[0008]** Another method of accessing a child's key zones for insulin administration is to manipulate clothing to uncover the area where access is needed. This can be a very difficult task when clothing is long, such as long sleeves, and tight or close fitting. The task can also be time consuming or uncomfortable in such circumstances, prolonging the trauma or agony for all involved (i.e., both parent and child). This process can be especially irritating or embarrassing for young children who are already traumatized by the fact that they are being tested for blood sugar levels and injected with insulin many times per day.

**[0009]** In an effort to minimize the uncomfortable and oftentimes disturbing process of manipulating or removing clothing, yet another method of insulin administration includes injecting insulin through clothing. Various studies have been conducted on the health effects of injecting through clothing but no conclusive determinations have been made. Generally, though, it is not advisable due to sanitary concerns, especially for young children. Dirt, fabric fibers, and other impurities found on clothes can potentially taint the needle and be injected into the body. Also, it is nearly impossible to see if the insulin is getting completely absorbed into the body or if some is leaking out. Finally, the clothing fabric can remove the lubricant and damage the needle tip, increasing pain and discomfort when injecting.

**[0010]** Therefore, the need has arisen for clothing that is specifically designed to provide quick and easy access to specific locations of the body to facilitate the injection or application of medicine, particularly insulin. The need has arisen for clothing designed with easily opened closures to prevent or alleviate trauma for children needing medicine most importantly, but also for the parents or caregivers.

## SUMMARY OF THE INVENTION

**[0011]** According to the invention, garments and garment systems are provided that permit easy accessibility to medicament injection sites of the wearer. Each of the garments can have multiple access slots which overlie respective injection sites, e.g., arms, thighs, abdomen, and/or other body parts which tend to accumulate subcutaneous fat, making them suitable as injection sites, sometimes referred to as "key zones." Each of the access slots has a base portion and a corresponding flap portion. Openings are defined through the access slots, between the base and flap portions, and provide access to the skin of the wearer at the respective injection sites. The access slots can be incorporated into the garment in a visually inconspicuous manner by providing them on or within covers that replicate the look of, e.g., pockets, patches, or other structures concealing their appearance. It is further contemplated that the access slot(s) can be retrofitted into existing, commercially available, clothing, as desired.

**[0012]** According to a first aspect of the invention, a garment system is provided that includes a garment covering at least a portion of the body of a wearer and a slot that permits access to a skin surface area of the wearer, and a closure mechanism for selectively restricting access to the skin surface area through the slot. The closure mechanism can be, e.g., a hook and loop fastener assembly, a zipper, snaps, buttons, fabric ties, or others. The accessible skin surface area can be in an area of subcutaneous fat accumulation on the body of the wearer, whereby injectable medicaments can be dispensed through the slot, as desired.

**[0013]** In some implementations, the slot defines a length and a width dimension, the width dimension being generally constant in magnitude along the length such that it is a generally uniform opening. However, as desired, the opening width can be non-uniform or non-constant in magnitude along its length.

**[0014]** In yet other implementations, a flap selectively covers the slot. The flap can be visually concealed into the garment, or can take on a pocket-like appearance, a patch-like appearance, or others.

**[0015]** In some implementations, the garment includes multiple slots permitting enhanced accessibility to medicament injection sites or key zones. The slots can be provided at lateral and outwardly facing segments of, e.g., upper arm

portions of sleeves, thigh portions of garment leg segments, or overlying other key zones.

## BRIEF DESCRIPTION OF THE DRAWINGS

**[0016]** A clear conception of the advantages and features constituting the present invention, and of the construction and operation of typical mechanisms provided with the present invention, will become more readily apparent by referring to the exemplary, and therefore non-limiting, embodiments illustrated in the drawings accompanying and forming a part of this specification, wherein like reference numerals designate the same elements in the several views, and in which:

**[0017]** FIG. **1** is a front elevation view of a first garment in accordance with a preferred embodiment of the invention;

**[0018]** FIG. **2** is a front elevation of a one-piece, full body garment according to the present invention;

**[0019]** FIG. **3** is a front elevation of a short sleeve, upper body garment according to the present invention;

**[0020]** FIG. **4** is a front elevation of a long-sleeve, upper body garment according to the present invention;

**[0021]** FIG. **5** is a close-up front elevation of a lower body garment according to the present invention;

**[0022]** FIG. **6** is a close-up front elevation of an access slot incorporated into a suitable garment, in a closed configuration; and

**[0023]** FIG. **7** is a close-up front elevation of an access slot incorporated into a suitable garment, in an open configuration.

**[0024]** In describing the preferred embodiment of the invention which is illustrated in the drawings, specific terminology will be resorted to for the sake of clarity. However, it is not intended that the invention be limited to the specific terms so selected and it is to be understood that each specific term includes all technical equivalents which operate in a similar manner to accomplish a similar purpose.

## DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

**[0025]** The present invention and the various features and advantageous details thereof are explained more fully with reference to the non-limiting embodiments described in detail in the following description.

**[0026]** A garment system is provided in which various garments permit enhanced accessibility to medicament injection sites, or "key zones" , of the wearer. The garment system, constructed according to the present invention, is indicated generally as, e.g., garment system **5** in FIGS. **1-5**.

**[0027]** Referring now to FIG. **1**, garment system **5** includes garment **10** which has multiple access slots **100** incorporated thereinto. The access slots **100** are located at portions of the garment **10** that correspond to typical key zones, providing the wearer relatively easy access to such key zones without removal of or adjusting the garment **10** itself.

**[0028]** Referring now to FIG. **2**, garment **10** is any of a variety of suitable garments that would typically be worn by an individual. In other words, although only certain garments **10** are exemplarily illustrated, it is fully understood that the particular garment **10** is selected based on, e.g., the intended end use environment and associated style or other considerations. In some implementations, the preferred materials for garment **10** include, e.g., various micro fleece fabrics, cotton or cotton/polyester blends, and/or other stretchy or woven fabrics. Notwithstanding, regardless of the particular fabrics or materials used, or the particular characteristics such as color, texture, nap, others, the garment **10** should be suitably comfortable for the wearer.

**[0029]** The particular garment **10** seen in FIG. **2** is a one-piece, full-body garment, such as a "onesie," romper, or pajama, e.g., pajama **12**. Conventional romper or pajama portions are incorporated into pajama **12**, including, e.g., full, optionally partial, length leg segments and arm sleeves, elastic cuffs or bindings at the ankle, wrist, neckline, or other portions, a zipper extending up the front torso portion, and/or other features or configurations as desired.

**[0030]** Access slots **100** can be provided at locations on the pajama **12**. For example, access slots **100** are located at each of the outer surface of the upper thigh portion of pajama **12**. Yet other access slots **100** are provided at the outer surface of the upper arm portion. Access slots **100** can be provided elsewhere on the pajama **12**, preferably superposing, overlying, or otherwise located at portions of the pajama that correspond to key zones or other medicament injection sites.

**[0031]** Referring now to FIG. **3**, garment **10** can embody an upper body garment, such as short-sleeved T-shirt **14**. Like pajama **12**, T-shirt **14** includes the various conventional T-shirt components including, e.g., torso segment, short arm sleeves, collared or other neck portion, and/or other features or configurations as desired. Access slots **100** can be provided at analogous locations on the T-shirt **14**. For example, access slots **100** are located at each of the outer surface of the upper arm portion, **15**A.

**[0032]** In some implementations, T-shirt **14** further includes a second or outer sleeve segment **15**B. Outer sleeve segment **15**B is a material member that covers or overlies the upper arm portion **15**A, similar to how the sleeve of a short-sleeved dress shirt might cover the sleeve of a short-sleeved undershirt. The outer sleeve segments **15**B can lie loosely over upper arm portions **15**A, or be selectively attached thereto, by way of hook and loop fasteners, zippers, buttons, snaps, and/or otherwise, as desired.

**[0033]** Since the access slot **100** is provided in the upper arm portion **15**A, the outer sleeve segment **15**B serves as, e.g., a loose over-layer that conceals the access slot **100**, when not in use. The outer sleeve segments **15**B can be made from the same material as the remainder of T-shirt **14**, whereby the overall appearance of the T-shirt **14** resembles that of, preferably visually indiscernible from, a conventional shirt.

**[0034]** Referring now to FIG. **4**, in some implementations, garment **10** is an upper body garment with long sleeves, such as sweatshirt **16**. Sweatshirt **16** includes numerous common sweatshirt components, such as, e.g., a torso segment, long arm sleeves, hooded or other neck portion, various elastic components, drawstring components, pockets, and/or other features or configurations as desired. Access slots **100** are again located at each of the outer surface of the upper arm portion, **17**A.

**[0035]** In some implementations, sweatshirt **16** further includes a concealing member, such as patch-like cover **17**B. Patch-like covers **17**B are material members that cover or overlie the upper arm portions **17**A, and the respective access slots **100**. Patch-like covers **17**B can themselves have slots or openings, registered or otherwise aligned with access slots **100**, permitting selective access thereto. In other

implementations, the patch-like covers **17**B are continuous, non-slotted, material members that are at least partially temporarily attached to the upper arm portions **17**A, by way of, e.g., hook and loop fasters, zippers, buttons, snaps, and/or other suitable means.

**[0036]** Patch-like covers **17**B can be made from the same material as the remainder of sweatshirt **16** to mitigate their visual impact. However, as desired, patch-like covers **17**B can be made from a dissimilar material such that they are visually conspicuous, and easily recognizable as patches, preferably visually indiscernible from conventional patches.

**[0037]** Referring now to FIG. **5**, in some implementations, garment **10** is a lower body garment with long leg segments, such as pants **18**. Pants **18** includes numerous common components, such as, e.g., leg segments, zippered or other fly portion, belt loops, pockets, and/or other features or configurations as desired. Access slots **100** are again located at each of the outer surface of the upper thigh portion, **19**A.

**[0038]** As desired, pants **18** can further include various concealing members, such as pocket-like covers **19**B. Although labeled as being "pocket-like," it is fully appreciated, and well within the scope of the invention, that pocket-like covers **19**B can have at least some, optionally all, the functionality of a typical garment pocket. Similar to patch-like covers **17**B, pocket-like covers **19**B are material members that cover or overlie the respective access slots **100**, only the pocket-like covers **19**B are provided upon the upper thigh portion **19**A of pants **18**.

**[0039]** Pocket-like covers **19**B can include slots or openings, registered or otherwise aligned with access slots **100**, permitting selective access to the slots **100** and the key zone(s) of the wearer. However, as desired, pocket-like covers **19**B can be continuous, non-slotted, or unitary material members that are at least partially temporarily attached to the upper arm portions **17**A, by way of, e.g., hook and loop fasters, zippers, buttons, snaps, and/or other suitable means of attaching or fastening material(s).

**[0040]** Pocket-like covers **19**B can be made from the same or dissimilar material as the remainder of pants **18**, as desired. Preferably pocket-like covers **19**B are made of the same material and incorporated into the overall design of pants **18** to not distract from the overall aesthetic characteristics of the pants. In other words, pocket-like covers **19**B can largely duplicate the appearance of, preferably visually indiscernible from, conventional pockets that might be on outer thigh surfaces of pants, such as, e.g., cargo pants.

**[0041]** Referring now to FIGS. **6-7**, access slots **100** can be incorporated into any of the above discussed garment systems **5**, garments **10**, and thus ones of pajama **12**, T-shirt **14**, sweatshirt **16**, pants **18**, or other suitable garments. Each access slot **100** includes an aperture or opening **105** extending therethrough, which provides the access to key zones or other medicament injection sites.

**[0042]** Access slots **100**, in particular openings **105**, are adapted and configured to selectively provide suitable access to the respective key zones, whereby a sufficient surface area of the wearer's skin is exposed through the openings **105**. In some implementations, the openings **105** exposes a skin surface area of at least about 2 inches$^2$, optionally at least about 6 inches$^2$, optionally at least about 10 inches$^2$, or otherwise. The particular opening area, perimeter shape, and/or other characteristics of access slots **100** are selected based on the size of the garment **10** and thus the size of the wearer, the relative sizes of particular key zones, the desired amount of injection site variation within the key zones, and/or others.

**[0043]** Preferably, openings **105** are narrow slits, as though they were merely split or slotted portions of the material of garment **10**. The opening **105** can define an opening width dimension, between generally straight lateral edges, that is generally constant along the entire length of the opening **105**. Optionally, the opening **105** can be defined between arcuate lateral edges. In such implementations, the opening **105** can be relatively wider in the middle portion and taper down to one or more relatively more narrow ends. In yet other embodiments, the opening **105** can define a substantially rectangular, square, or other polygonal perimeter as desired, depending on the amount of skin surface area exposure of the key zone that is sought through opening **105**.

**[0044]** In most implementations, the opening **105** is defined between a base portion **110** and a flap portion **120** which are selectively connected to each other by a closure mechanism **130**. Base portion **110** is, e.g., a piece of material attached to or integral with the garment **10**. It is the portion of the access slot **100** that remains connected to the garment **10** at all times, during use. Accordingly, a first lateral edge of base portion **110** is adjacent and interfaces with the garment, whilst a second lateral edge of base portion **110** is adjacent and interfaces with opening **105**. An outwardly facing surface of base portion **110** includes a first fastening component **150** of the closure mechanism **130**, for selectively closing the access slots **100**.

**[0045]** Flap portion **120** is adapted and configured to selectively extend over and cover the access slot **100**. In other words, flap portion **120** functions, at least in part, to permit or restrict access to the opening **105** and thus permit or restrict access to the key zones. A first end or segment of flap portion **120** is secured to the garment **10**, adjacent the opening **105**, on the opposing side of the opening **105** with respect to the base portion **110**. A second end or segment of flap portion **120**, distal the point of attachment between the flap portion **120** and garment **10**, includes a second fastening component **155** of the closure mechanism **130**, for selectively closing the access slots **100**.

**[0046]** First and second fastening components **150**, **155** cooperate with each other to provide the selective closing and opening functionality of the closure mechanism **130**. Preferably, the closure mechanism is a hook and loop system, such as that available and sold under the Brand Name Velcro®. In such implementations, the first and second fastening components **150**, **155** can be either of the hooks or the loops, respectively, as desired. Notwithstanding, other products, devices, and mechanisms which can suitably retain the access slot **100** in a temporarily closed condition can be utilized as closure mechanism **130**, including, e.g., zippers, buttons, snaps, fabric ties, and/or others as desired.

**[0047]** In light of the above, to use the garment system **5**, in some regards, the user or wearer uses it in substantially the same manner as conventional clothing. Thus, the wearer merely selects the appropriate garment **10** based on weather conditions, activity, style, or otherwise.

**[0048]** When the wearer requires delivery of an injected medicament, the wearer releases the closures mechanism **130** by, e.g., releasing the hook and loop fastener(s), unzipping the zipper, unbuttoning the buttons, unsnapping the snaps, untying the ties, or otherwise, depending on the

particular configuration of the closure mechanism **130**. Next, the wearer pulls the flap portion **120** away from the base portion **110**, sufficiently far to manipulate the access slot **100**. If needed, the edges of the access slot are adjusted so that the opening **105** directly overlies the desired key zone and injection site, exposing the respective surface area portion of skin of the user. The medicament is administered by injection, e.g., subcutaneous or other injection methods, into the key zone of the wearer. Then, the access slot **100** is closed by generally reversing the procedures used to release the closure mechanism **130**.

**[0049]** At no point during the use of garment system **5** is the wearer required to (i) remove garment **10**, (ii) partially remove garment **10**, (iii) expose a non-key zone portion of their body, or (iv) expose a skin surface area larger than exposed through the opening **105** of the access slot **100**, even while administering the injectable medicament.

**[0050]** The medicaments are any of those that are administered by injection, but can be particularly useful for insulin injection treatments for coping with diabetes. Diabetics tend to inject insulin in key zones that are largely inaccessible without removing or partially removing clothing, yet can be generally easily reached by the individual him/herself, or a caretaker, whereby the garment system **5** can prove particularly useful for individuals, adult or child, with diabetes.

**[0051]** Although the best mode contemplated by the inventors of carrying out the present invention is disclosed above, practice of the present invention is not limited thereto. It will be manifest that various additions, modifications, and rearrangements of the features of the present invention may be made without deviating from the spirit and scope of the underlying inventive concept. The scope of still other changes to the described embodiments that fall within the present invention but that are not specifically discussed above will become apparent from the appended claims.

What is claimed is:

**1**. A garment system, comprising:
- a garment configured to cover at least a portion of the body of a wearer;
- a slot permitting access to a skin surface area of the wearer in an area of subcutaneous fat accumulation; and
- a closure mechanism selectively restricting access to the skin surface area through the slot,
- wherein the slot and closure mechanism cooperate to selectively permit dispensation of an injectable medicament through the slot.

**2**. The garment system of claim **1**, wherein the slot defines a length and a width dimension, the width dimension being generally constant in magnitude along the length.

**3**. The garment system of claim **1**, wherein the slot defines a length and a width dimension, the width dimension being generally non-constant in magnitude along the length.

**4**. The garment system of claim **1**, wherein a flap selectively covers the slot.

**5**. The garment system of claim **4**, wherein the flap has pocket-like appearance characteristics.

**6**. The garment system of claim **4**, wherein the flap has patch-like appearance characteristics.

**7**. The garment system of claim **1**, wherein the closure mechanism is a hook and loop fastener assembly.

**8**. The garment system of claim **1**, wherein the closure mechanism is a zipper assembly.

**9**. The garment system of claim **1**, wherein the closure mechanism is a button assembly.

**10**. The garment system of claim **1**, wherein the closure mechanism is a fabric tie assembly.

**11**. A garment system, comprising:
- a garment having appendage covering segments that cover at least parts of appendages of a wearer; and
- multiple slots extending through the appendage covering segments of the garment, the slots being manipulatable between a first closed condition and a second open condition,
- wherein when the slot is in the closed condition, access therethrough is restricted, and when the slot in the open condition, administration of an injectable medicament is permitted therethrough.

**12**. The garment system of claim **11**, wherein the appendage covering segments are sleeves.

**13**. The garment system of claim **11**, wherein the appendage covering segments are leg segments.

**14**. The garment system of claim **12**, wherein the slots extend through portions of the sleeves that cover the upper arms of the wearer.

**15**. The garment system of claim **13**, wherein the slots extend through portions of the leg segments that cover the thighs of the wearer.

**16**. The garment system of claim **14**, wherein the slots extend through lateral outwardly facing portions of the sleeves.

**17**. The garment system of claim **15**, wherein the slots extend through lateral outwardly facing portions of the leg segments.

**18**. A garment system, comprising:
- a garment configured to cover at least a portion of the body of a wearer;
- a slot permitting access to a skin surface area of the wearer in an area of subcutaneous fat accumulation;
- a flap selectively overlying the slot;
- a closure mechanism attached to the flap and temporarily attaching the flap to the garment,
- wherein when the flap is temporarily attached to the garment, the flap overlies the slot and restricts access therethrough, and when the flap does not overlie the slot, administration of an injectable medicament is permitted therethrough.

**19**. The garment system of claim **14**, wherein the garment includes sleeves and the slot extends through a lateral outwardly facing upper arm portion of one of the sleeves.

**20**. The garment system of claim **15**, wherein the garment includes leg segments and the slot extends through a lateral outwardly facing portion of one of the leg segments.

* * * * *