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(54) **PROTECTIVE GARMENT FOR USE BY A FIREFIGHTER OR OTHER EMERGENCY WORKER AND HAVING A DETACHABLE CUFF/WRISTLET**

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(57) **ABSTRACT**

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A protective garment (10) is provided for use by a firefighter or other emergency worker, and includes an outer shell (16) having a torso covering portion (22), a pair of limb covering portions (24), and a pair of cuffs or cuffs/wristlets combination (26). Each of the cuffs or cuffs/wristlets combination (26) is releasably attached to an open end (28) of one of the limb covering portions (24) to allow the cuff or cuff/wristlet combination (26) to be removed for cleaning or replacement.

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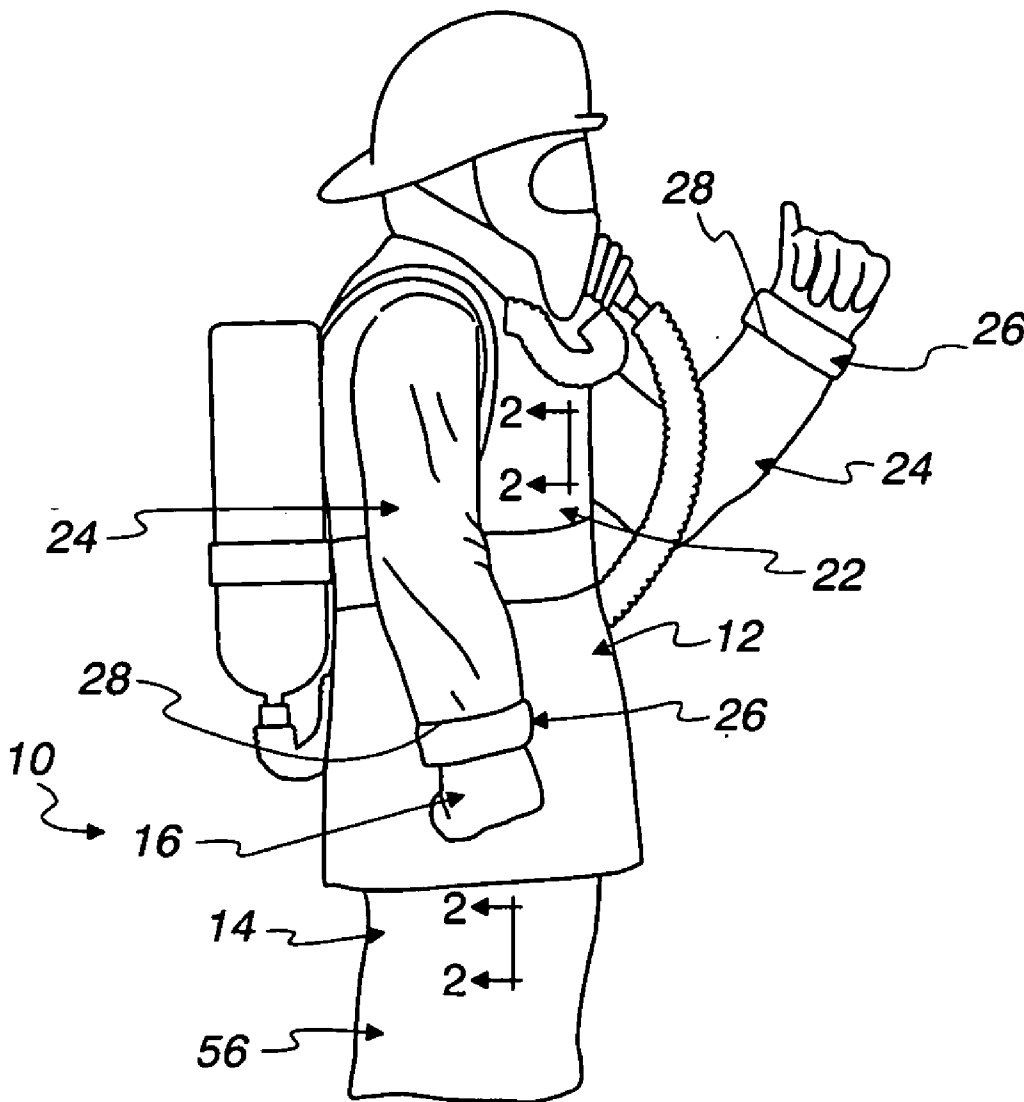


Fig. 1

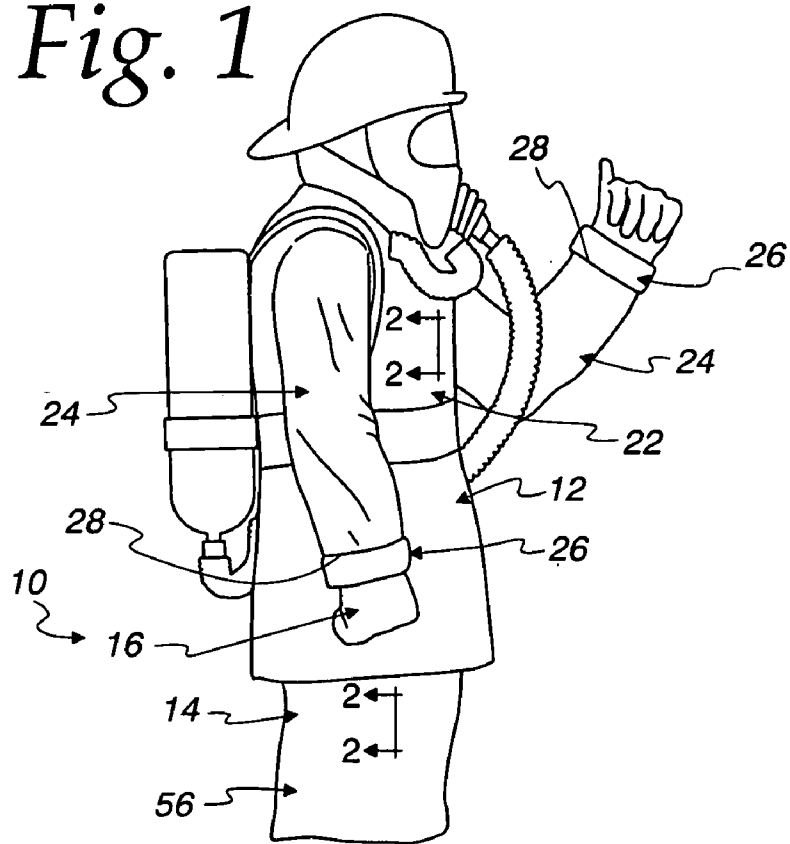


Fig. 2

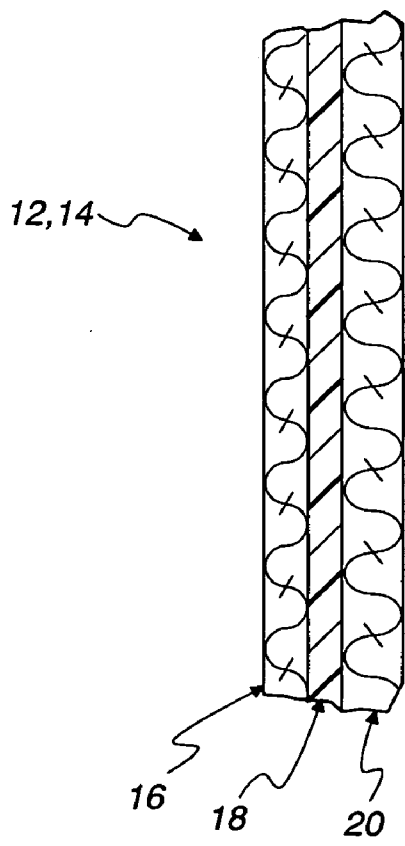


Fig. 3

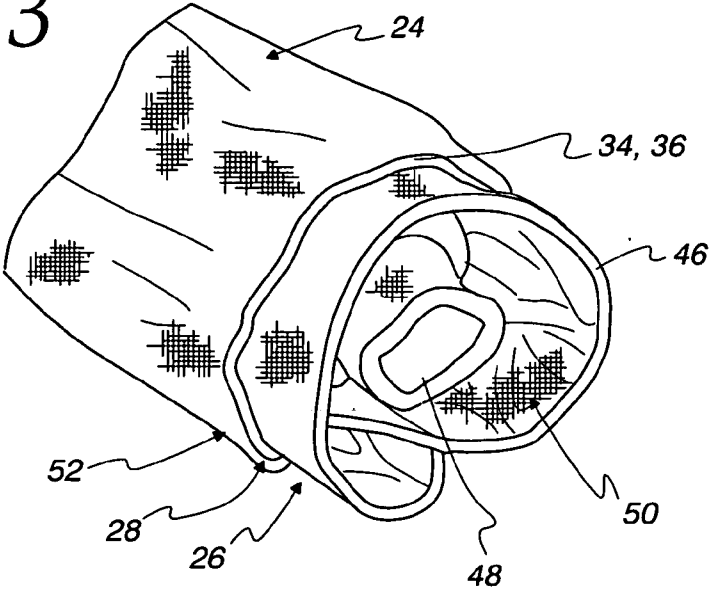


Fig. 4

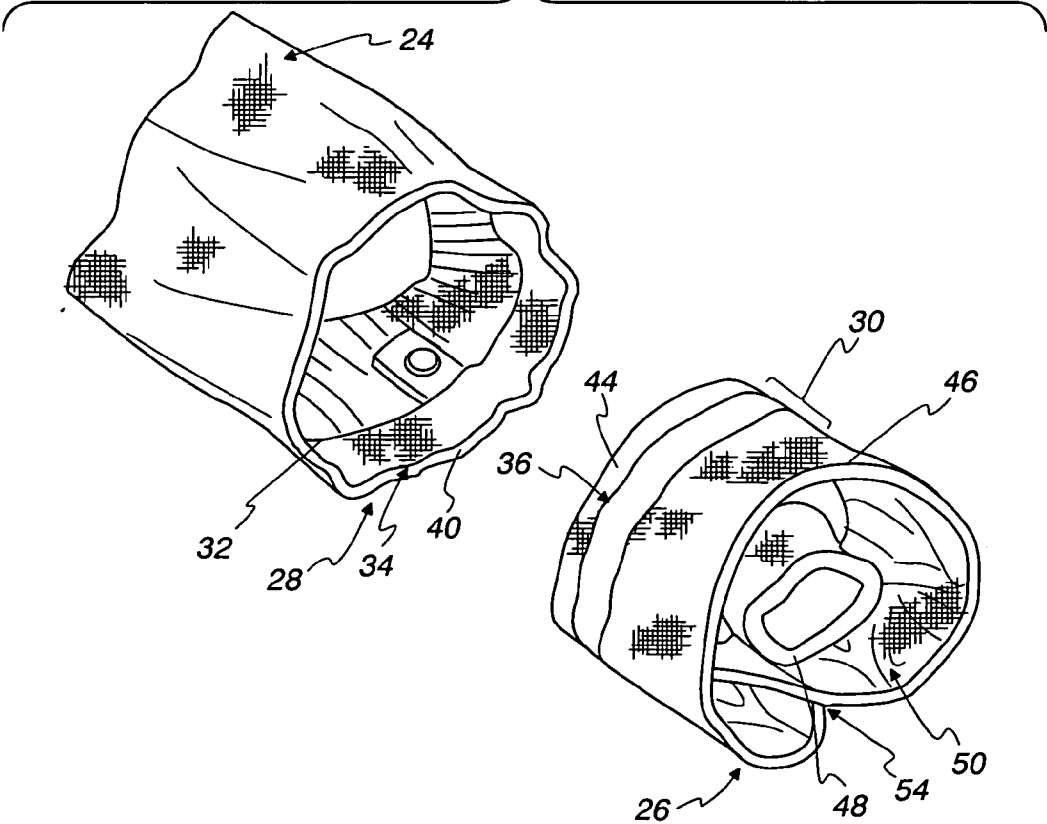


Fig. 5

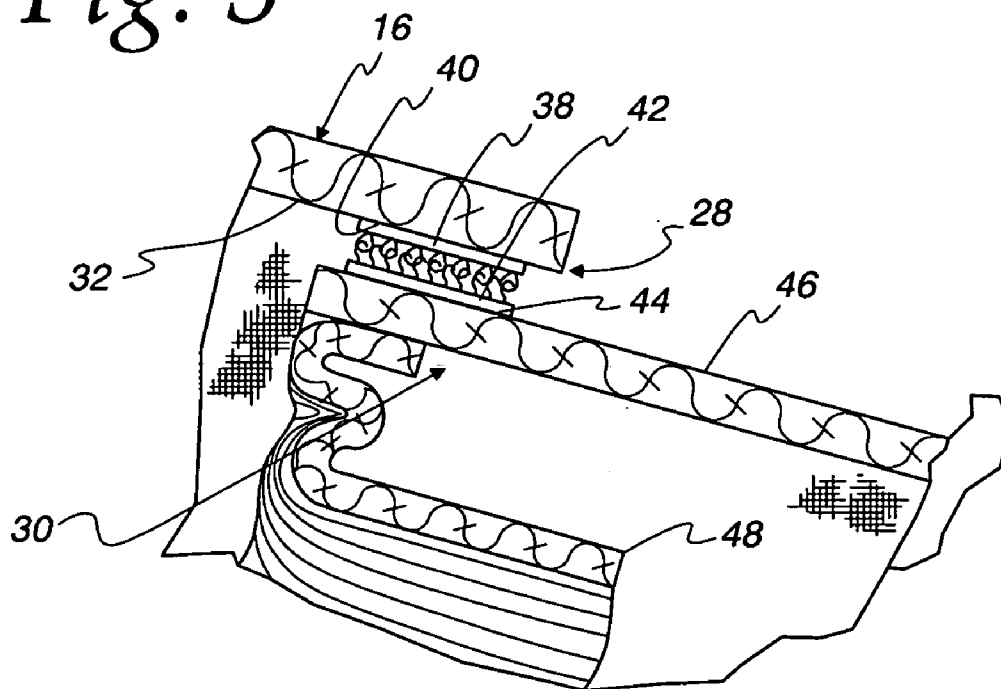
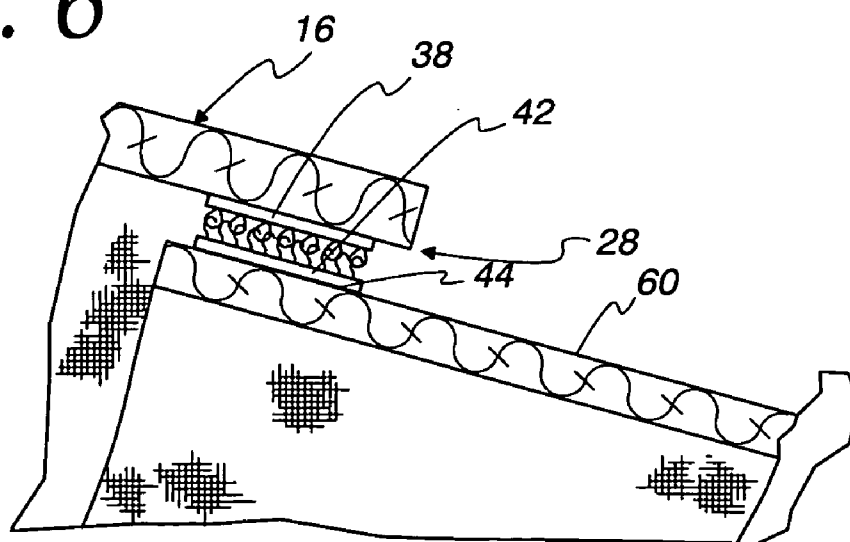


Fig. 6



PROTECTIVE GARMENT FOR USE BY A FIREFIGHTER OR OTHER EMERGENCY WORKER AND HAVING A DETACHABLE CUFF/WRISTLET

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] Not Applicable.

FEDERALLY SPONSORED RESEARCH OR DEVELOPMENT

[0002] Not Applicable.

MICROFICHE/COPYRIGHT REFERENCE

[0003] Not Applicable.

FIELD OF THE INVENTION

[0004] This invention relates to protective garments, and more particularly to protective garments such as worn by firefighters and other emergency workers.

BACKGROUND OF THE INVENTION

[0005] Commonly, protective garments, such as those worn by firefighters and other emergency workers, have an outer shell with one or more inner liners which may be secured to the outer shell by seams, hook and loop fasteners, snaps, buttons, and the like. It is known for the outer shells of such protective garments to include aluminized materials and/or treatments which are not recommended for machine washing and/or immersion, but do allow for the shell to be wiped down for the purposes of cleaning. However, while this is suitable for the majority of the outer shell, problems have occurred with the cleanliness of the portions of the shell that contact the user's body, such as, for example, collars and wristlets.

SUMMARY OF THE INVENTION

[0006] In accordance with one feature of the invention, a protective garment is provided for use by a firefighter or other emergency worker. The protective garment includes an outer shell having a torso covering portion, a pair of limb covering portions extending from the torso covering portion, and a pair of cuffs or wristlets, each cuff/wristlet releasably attached to an open end of a corresponding one of the limb covering portions to allow the cuff to be removed for cleaning or replacement.

[0007] In one feature, each of the cuffs is a cuff/wristlet combination that is releasably attached to the open end of the corresponding one of the limb covering portions to allow the cuff/wristlet combination to be removed for cleaning or replacement.

[0008] As one feature, each of the cuffs is attached to an interior side of the open end of the corresponding limb covering portions.

[0009] According to one feature, a portion of each of the cuffs extends into the open end of the corresponding limb covering portion.

[0010] In one feature, the open end of each limb covering portion surrounds a portion of the corresponding cuff. As a further feature, the portion of the corresponding cuff is attached to the open end of the corresponding limb covering portion.

[0011] As one feature, the protective garment further includes releasable fasteners attaching the cuffs to the open ends of the limb covering portions. In a further feature, the releasable fasteners comprise hook and loop fasteners.

[0012] In accordance with one feature of the invention, a protective garment is provided for use by a firefighter or other emergency worker. The protective garment includes an outer shell having a torso covering portion, and a pair of limb covering portions extending from the torso covering portion, each of the limb covering portions having an open end with releasable fasteners configured to receive and releasably connect to a corresponding cuff or cuff/wristlet combination. As a further feature, the releasable fasteners comprise hook and loop fasteners.

[0013] In accordance with one feature of the invention, a removable cuff or cuff/wristlet combination is provided for use with a protective garment of a firefighter or other emergency worker. The cuff or cuff/wristlet includes at least one releasable fastener for releasable connection with a corresponding releasable fastener on a limb covering portion of the protective garment. As a further feature, the at least one releasable fastener includes a hook and loop fastener.

[0014] In accordance with one feature of the invention, the protective garment is a protective coat.

[0015] Other objects, features, and advantages of the invention will become apparent from a review of the entire specification, including the appended claims and drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

[0016] FIG. 1 is a perspective view from the side of a fireman or other emergency worker wearing protective garments embodying the present invention;

[0017] FIG. 2 is an enlarged section view taken from either of lines 2-2 in FIG. 1;

[0018] FIG. 3 is an enlarged view of a sleeve of the garment of FIG. 1 including a cuff/wristlet combination;

[0019] FIG. 4 is an exploded view of FIG. 3;

[0020] FIG. 5 is a section view taken from line 5-5 in FIG. 3; and

[0021] FIG. 6 is a view similar to FIG. 5 but showing an alternate embodiment.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

[0022] With reference to FIG. 1, a firefighter or other emergency worker is shown wearing protective garments 10 in the form of a coat 12 and a pair of pants 14. With reference to FIG. 2, both the coat 12 and the pants 14 are preferably of a multi-layered construction consisting of an outer shell 16, a moisture barrier liner 18, and optionally, but preferred, a thermal insulating barrier liner 20. Each of the layers 16, 18 and 20 can be made from suitable fabrics for each of their particular functions, many of which are known. For example, the outer shell 16 can be made from any suitable fire resistant, thermal resistant, and/or wear resistant (i.e., resistant to cuts, snaps, tears and abrasions) material, some examples of which include Kevlar®, Nomex®, Basofil, PBI (polybenzimidazole), and PBO (poly(p-phenylene-benzobisoxazole)) materials. In this regard, the invention as described herein is particularly advantageous with outer shell materials that are not amenable to machine washing and/or water immersion, one

example of which are aluminized materials, such as aluminized Kevlar® and Nomex® and knit Pbi™/Kevlar® aluminum substrate.

[0023] With reference to FIG. 1, it can be seen that the coat 12 includes a torso covering portion 22, a pair of limb covering portions 24 in the form of sleeves extending from the torso covering portion 22, and a pair of cuff/wristlet combinations 26 that are releasably attached to an open end 28 of a corresponding one of the limb covering portions 24 to allow the corresponding cuff/wristlet combination 26 to be removed for cleaning or replacement. As best seen in FIGS. 3 and 4, a portion 30 of each of the cuff/wristlet combination 26 extends into the open end 28 of the corresponding limb covering portion 24, with the open end 28 surrounding the portion 30 and the cuff/wristlet combination 26 being attached to an interior side 32 of the open end 28. In this regard, any suitable releasable fastener, shown schematically at 34 and 36, can be used to releasably attach the cuff/wristlet combination to the open ends of the limb covering portions, and as best seen in FIG. 5, in one preferred embodiment, the releasable fasteners 34,36 are provided in the form of hook and loop fasteners, with a hook and loop strip 38 attached to the interior side 32 and extending around the entire periphery 40 of the open end 28, and a hook and loop strip 42 attached to the portion 30 and extending around the entire periphery 44 of the portion 30. Other suitable fasteners include, for example, suitable zippers, buttons, snap fasteners and/or toggle and loop fasteners.

[0024] As best in FIG. 4, each of the cuff/wristlet combination 26 preferably includes a cuff portion 46 that is made from a suitable outer shell material, (such as previously described) that may or may not be the same as the rest of the outer shell 16, and a wristlet 48 that is fixed to the cuff portion 46, such as by stitching, and is configured to closely conform to the wrist/arm of a user, preferably being made from a suitable elasticized material, many of which are known, that will allow the wristlet 48 to stretch with the user's arm/wrist. Furthermore, the cuff portion 46 may include an integral thermal and/or waterproof liner 50, and the corresponding limb covering portion 24 may include a portion 52 surrounding the periphery of the open end 28 that is reinforced by the same outer shell material as the cuff portion 46. The cuff portion 46 may include an adjustable division, such as at 54 that allows for the circumferential size of the cuff portion 46 to be adjusted by a user.

[0025] An alternate embodiment is shown in FIG. 6 wherein the cuff/wristlet combination 26 has been replaced with a cuff 60 that does not include the wristlet 48. In this regard, if desired, a wristlet similar to the wristlet 48 may be provided as another part of the protective garment or a lining thereof.

[0026] It should be appreciated that while preferred embodiments have been described herein, other arrangements for the detachable cuff/wristlet combination 26 or cuff 60 may be desirable depending upon the parameters of each particular application. For example, while the illustrated embodiments show the portion 30 extending into the open end 28, in some applications it may be desirable for the portion 30 to surround the open end 28. Similarly, as a further example, while the illustrated embodiments show the cuff/wristlet combination 26 or cuff 60 being attached to the interior side 32 of the open end 28, in some applications it may be desirable for the cuffs/wristlets 26 to be attached to the exterior side of the open end 28.

[0027] While the cuff/wristlet combination 26 and cuff 60 have been described herein in connection with the coat 10, it should be appreciated that the cuff/wristlet combination 26 and cuff 60 could also be incorporated at the open ends of the pant legs 56 extending from lower torso covering portion of the pants 14, with the wristlet 48, if included, being configured to closely conform to a user's leg and/or ankle and the cuff portion 46 being sized to extend over a corresponding boot worn by the user.

1. A protective garment for use by a firefighter or other emergency worker, the protective garment comprising an outer shell having a torso covering portion, a pair of limb covering portions extending from the torso covering portion, and a pair of cuffs, each cuff releasably attached to an open end of a corresponding one of the limb covering portions to allow the cuff to be removed for cleaning or replacement.

2. The protective garment of claim 1 wherein each of the cuffs is part of a cuff/wristlet combination that is releasably attached to the open end of a corresponding one of the limb covering portions to allow the cuff/wristlet combination to be removed for cleaning or replacement.

3. The protective garment of claim 1 wherein each of the cuffs is attached to an interior side of the open end of the corresponding limb covering portions.

4. The protective garment of claim 1 wherein a portion of each of the cuffs extends into the open end of the corresponding limb covering portion.

5. The protective garment of claim 1 wherein the open end of each limb covering portion surrounds a portion of the corresponding cuff.

6. The protective garment of claim 5 wherein the portion of the corresponding cuff is attached to the open end of the corresponding limb covering portion.

7. The protective garment of claim 1 wherein further comprising releasable fasteners attaching the cuffs to the open ends of the limb covering portions.

8. The protective garment of claim 7 wherein the releasable fasteners comprise hook and loop fasteners.

9. A protective coat for use by a firefighter or other emergency worker, the protective coat comprising an outer shell having a torso covering portion, a pair of limb covering portions extending from the torso covering portion, and a pair of cuffs, each cuff releasably attached to an open end of a corresponding one of the limb covering portions to allow the cuff to be removed for cleaning or replacement.

10. The protective coat of claim 9 wherein each of the cuffs is part of a cuff/wristlet combination that is releasably attached to the open end of the corresponding one of the limb covering portions to allow the cuff/wristlet combination to be removed.

11. The protective coat of claim 9 wherein each of the cuffs is attached to an interior side of the open end of the corresponding limb covering portions.

12. The protective coat of claim 9 wherein a portion of each of the cuffs extends into the open end of the corresponding limb covering portion.

13. The protective coat of claim 9 wherein the open end of each limb covering portion surrounds a portion of the corresponding cuff.

14. The protective coat of claim 13 wherein the portion of the corresponding cuff is attached to the open end of the corresponding limb covering portion.

15. The protective coat of claim **9** wherein further comprising releasable fasteners attaching the cuffs to the open ends of the limb covering portions.

16. The protective coat of claim **15** wherein the releasable fasteners comprise hook and loop fasteners.

17. A protective coat for use by a firefighter or other emergency worker, the protective coat comprising an outer shell having a torso covering portion, and a pair of limb covering portions extending from the torso covering portion, each of the limb covering portions having an open end with releasable fasteners configured to receive and releasably connect to a corresponding cuff or cuff/wristlet combination.

18. The protective coat of claim **17** wherein the releasable fasteners comprise hook and loop fasteners.

19. A protective garment for use by a firefighter or other emergency worker, the protective garment comprising an outer shell having a torso covering portion, and a pair of limb covering portions extending from the torso covering portion, each of the limb covering portions having an open end with releasable fasteners configured to receive and releasably connect to a corresponding cuff.

20. The protective garment of claim **19** wherein the releasable fasteners comprise hook and loop fasteners.

21. A removable cuff/wristlet combination for use with a protective garment of a firefighter or other emergency worker, the cuff/wristlet combination comprising at least one releasable fastener for releasable connection with a corresponding releasable fastener on a limb covering portion of the protective garment.

22. The cuff/wristlet combination of claim **21** wherein the at least one releasable fastener comprises a hook and loop fastener.

23. A removable cuff for use with a protective garment of a firefighter or other emergency worker, the cuff comprising at least one releasable fastener for releasable connection with a corresponding releasable fastener on a limb covering portion of the protective garment.

24. The cuff of claim **19** wherein the at least one releasable fastener comprises a hook and loop fastener.

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