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(54) Title: COMBINATION FIRE-RESISTANT APRON, FIRE BLANKET AND HEAT-RESISTANT MITTS

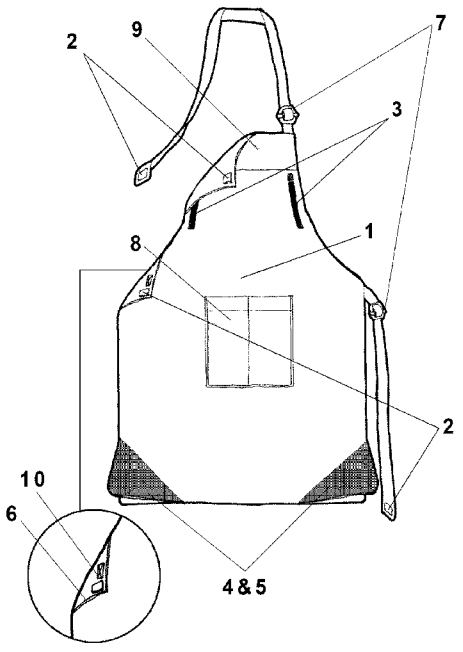

Figure 1(Front Side)

(57) **Abstract:** This invention pertains to the domain of personal protective equipment (PPE), specifically to an embodiment of a combination fire-resistant apron (1), fire blanket feature (3,11), and heat-resistant mitts (4), aimed at delivering versatile and efficient fire safety protection across various contexts such as domestic households, commercial kitchens, industrial premises, and other environments fraught with heat and fire risks. Fire safety is of paramount importance in settings vulnerable to sources of ignition, including but not limited to kitchens, industrial environments, and similar locations. Traditional fire safety mechanisms like fire extinguishers, smoke detectors, and fire alarms, while effective in identifying and quelling fires, might not provide sufficient protection to individuals closely interacting with flames or heat, such as chefs, welders, or industrial workers. Numerous technologies have been suggested to provide multifaceted protection to individuals in environments at risk of fire or high temperatures. These solutions include heat-resistant mitts, fire blankets, and fire-resistant aprons engineered to shield against heat and fire risks. However, these solutions as standalone could be unwieldy, difficult to manage, or may not consistently deliver enough protection. The apron stands apart by offering more than just personal fire protection — it can also be used to extinguish fires. In the initial stages of a fire, which can rapidly escalate, every second is crucial. People tend to instinctively grab whatever is close at hand, often leading to unpreparedness and injuries. Any delay in finding an appropriate fire suppression device will only allow the fire to grow uncontrollably before effective measures can be implemented. This is why firefighting organisations and reputable government bodies or regulations warn against using improper tools during fires, such as using water on a chip pan fire, which only worsens the situation. Our solution provides people with the means to follow their instincts while safely and effectively quelling fires, thereby

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preventing harm to individuals and property. Our innovative invention combines the fire-resistant apron's unique features, enabling individuals to act on their instincts when faced with a fire. At the same time, it offers a reliable method of promptly and efficiently extinguishing flames. By addressing the challenges associated with fire ignition, we provide users with a practical and safe solution. Our goal is to equip individuals with the tools needed to safeguard themselves and their surroundings, enabling swift and effective fire suppression to mitigate the potential consequences of fire incidents.

Detailed Description of the Invention:

The invention of a combined fire-resistant apron (1), fire blanket feature (3,11), and heat-resistant mitts (4) provides a comprehensive and adaptable solution for fire and heat safety protection across various environments, such as domestic households, commercial kitchens, industrial premises, and other environments with heat processes fraught with ignition risks.

The combination fire-resistant apron (1) can be preferably made from a fire inherent material, or any other embodiments of fire-resistant materials.

The innovative fire-resistant apron illustrated is engineered to prioritise user comfort, protection and to smother a source of ignition from a fire and heat risk, exhibiting simple yet effective fastening and release mechanisms (2) such as hook-and-loop fasteners, buckles, snaps, pull tabs or other appropriate securing methods (7).

In emergency situations, the apron (1) can be effortlessly removed by the user using the pull tabs(3) and converted into a fire blanket (3,11), providing an initial means to smother flame or extinguish fires. The fire blanket surface area will include at least the minimum size as required by industry standards.

The product set also comprises of a heat-resistant mitt built into the corners, edges or hem (4) constructed from the same fire-resistant material, designed to safeguard the user's hands, wrists, forearms, also protecting the face and torso whilst applying the product as a fire blanket or in everyday use for handling hot objects. The heat-resistant mitts balance comfort and flexibility, enabling the user to carry out heat-related tasks efficiently. They are both washable and durable, representing a sustainable solution for fire safety protection.

The gripping side of the mitts—receiving the users combined thumb, fingers, and palm—are designed with an extra padded layer (5) for prolonged heat exposure while still maintaining tactile sensitivity.

The apron can be employed as a fire blanket in two ways: by utilizing the fire blanket tabs (3), the conventional method involves positioning two handles on both sides of the front chest area or with the heat-resistant mitts that provide comprehensive protection to the face, wrists, forearms, and torso; during emergency situations, the use of heat-resistant mitts facilitates the safe removal of utensils to prevent their involvement in the fire.

The combination fire-resistant apron (1), fire blanket (3,11), and heat-resistant mitts (4) are designed deliberately, ensuring sufficient material, and shaping to cover fires effectively (11), such as a cooking fire. The fire blanket tabs (3) at the front serve as a practical feature that allows individuals to easily grip and securely hold the blanket, enabling them to swiftly and effectively cover the flames for fire suppression purposes. Additionally, the design ensures effortless release when needed, granting users seamless control and maneuverability during critical fire incidents.

Safety managers or administrators can distribute them to employees, complete with RFID tags or similar acting chips (10), facilitating a structured and accountable approach to fire safety management and/or ensuring that these products are kept within the food safe areas.

Beyond these key features, the invention includes numerous other user-friendly aspects. For instance, the apron could incorporate several pockets (8) for storing utensils or other items, offering a practical solution for those working in heated or fire-prone settings. These pockets (8), like the rest of the apron, are made from fire-resistant material, enhancing the level of protection provided.

The apron could include fire resistant reflective strips (9) that increase the user's visibility in low-light or smokey conditions, ensuring that the user can be easily located by rescuers in case of an emergency particularly in industrial situations. These fire resistant reflective strips (9) could be placed strategically on the front and sides of the apron (1) to maximise visibility from all angles.

In addition to its practical features, the apron (1) also has an aesthetic appeal. It can be manufactured in various colours and designs, enabling users to select an apron that matches their brand preferences or adheres to specific workplace dress codes or uniform policies.

The invention also offers an environmentally friendly and sustainable approach to fire safety. The fireproof material used can be reused, and the apron (1) itself is washable, reducing waste and promoting a greener approach to fire safety protection.

To summarise, the combination fireproof apron (1), fire blanket feature (3,11), and heat-resistant mitts (4) of the present invention provide the following features and advantages:

1. Multifunctional protection for users in areas where ignition sources are present, including home use, commercial kitchens, industrial settings, and other environments where heat and fire hazards are present.
2. A fireproof material consisting of fire resistant inherent material with water resistant coating (6) on both sides, or any fire-resistant material ensuring quality and effectiveness in providing fire smothering and extinguishing properties.
3. An adjustable and comfortable fit, with various quick release fastening mechanisms (2) to secure the apron to the user's body.
4. A washable, foldable, and heat-resistant design, ensuring practicality and durability for various applications.
5. Integrated heat-resistant mitts (4) with an extra padded layer (5) provide additional protection for the user's hands when handling hot objects as well as protecting hands, wrist, forearms and torso when applying to extinguish a fire.
6. A fire blanket feature (3,11) that can be used in case of an emergency to extinguish flames or smother fires, minimising the risk of injury or property damage.

7. Compliance with safety protocols, fire blanket regulations and an organised approach to fire safety management through the issuance and logging of the apron in a safety record with the optional use of RFID tags or similar acting chips to restrict access to food safe areas (10) or PPE identification panel.
8. Enhanced protection compared to the prior art, addressing the limitations of existing fire safety solutions by offering a versatile and efficient solution for users in various applications and environments.
9. Potential for customisation and further development, allowing for the incorporation of additional features, such as pockets (8), loops, or other storage solutions to improve user convenience and functionality.
10. Aesthetic appeal and potential for various colour options and design styles, enabling users to select an apron that matches their brand preference or adheres to a specific workplace dress code or uniform policy.
11. Environmentally friendly and sustainable design, as the fireproof material (6) can be reused and the apron (1) is washable, reducing waste and promoting a greener approach to fire safety protection.
12. Versatility to various industries and applications, such as food service, welding, metalworking, glassblowing, and other industries where ignition hazards are present, making the combination fireproof apron (1), fire blanket (3,11), and heat-resistant mitts (4) a versatile and practical solution for a wide range of users.

In conclusion, the combination fireproof apron (1), fire blanket feature (3,11), and heat-resistant mitts (4) provided by the present invention offers a comprehensive and versatile solution for user and fire safety protection in various settings. The invention offers a unique combination of features that make it practical and efficient to use, while also providing a high level of instant protection for the user. This invention fills a crucial gap in the fire safety market by providing a multifunctional, easy-to-use solution that can be tailored to meet the unique needs of various industries and applications.

The essence of this product lies in harnessing people's natural instincts to tackle fires (such as using water on cooking oils) and guiding them towards an effective solution by providing a tool that truly makes a notable impact. Notably, heated oils and fats serve as a significant ignition source, with thousands of restaurant-related incidents being reported each year.

Description of Prior Art:

CN105167245A presents a multipurpose fire-resistant protective garment comprising an apron, gloves, hat, and scarf, providing all-around protection to the user and does not feature oven gloves. However, this invention could be inconvenient to utilise and might not offer sufficient protection in all circumstances. It also does not have the ability to extinguish a fire, feature a quick release mechanism or handles for protecting the hands, wrists, forearms, torso and face.

CN106388078A discloses a fire-resistant apron and a process to manufacture the same, composed of a fire-resistant material and a thermal insulation layer. Nonetheless, this

apron might not be apt for usage as a fire blanket, does not feature heat-resistant mitts, does not have the ability to extinguish a fire or feature a quick release mechanism or handles for protecting the hands, wrists, forearms, torso and face.

CN207070881U outlines a fire-resistant glove with a glove body and a flame-retardant fabric layer that safeguards against heat and fire threats. But the glove might not provide enough protection for other parts of the body, such as the torso, forearms, face or legs and does not have the ability to extinguish a fire or feature a quick release mechanism.

DE202011005566U1 portrays a fire-resistant apron made from a material resistant to high temperatures, suitable for hot procedures like cooking, baking, and welding. Still, the apron does not have the ability to extinguish a fire, feature a quick release mechanism or handles for protecting the hands, wrists, forearms, torso and face.

DE202011107157U1 exhibits a fire-resistant blanket composed of a fire-resistant material and a thermal insulation layer. However, it does not have the ability to extinguish a fire, feature a quick release mechanism or handles for protecting the hands, wrists, forearms, torso and face, or incorporate heat resistant mitts for use in various environments where an apron may be used.

DE202011003425U1 showcases a fire-resistant glove with a glove body and a material resistant to high temperatures. However, it does not have the ability to extinguish a fire, feature a quick release mechanism or handles for protecting the hands, wrists, forearms, torso and face.

ES12736Y depicts a fire-resistant apron made from a fire-resistant material and a water-resistant coating that safeguards against heat and fire threats. However, it does not have the ability to extinguish a fire, feature a quick release mechanism or handles for protecting the hands, wrists, forearms, torso and face.

CN207070880U reveals a multi-functional protective garment made from fireproof and waterproof material. The garment incorporates a detachable hood, adjustable sleeves, and an adjustable waistband, offering flexibility in its use. However, it does not have the ability to extinguish a fire, feature a quick release mechanism or handles for protecting the hands, wrists, forearms, torso and face.

PATENT CLAIMS:

Claim 1. A combination of quick release apron, fire blanket, and attached heat-resistant mitts for convenience and protection against heat and fire hazards, preferably comprising:

a. a fire-resistant apron body preferably constructed from a 3-ply material consisting of a first fireproof silicone coating, a fireproof fibreglass layer, and a second fireproof silicone coating or can be any other fire-resistant material, said apron body being convertible into a fire blanket.
b. heat-resistant mitts integrated into the corners, edges, or hem of said apron body, said mitts providing protection for the hands, wrists, forearms, face, and torso, said mitts are designed with an extra padded layer for prolonged heat exposure while still maintaining tactile sensitivity.
c. quick release fastening means for securing the apron body to a user, selected from the group consisting of hook-and-loop fasteners, snaps, buckles, and other suitable securing mechanisms.
d. a fire blanket feature, wherein said apron body can be converted into a fire blanket, with adequate and compliant coverage, for smothering flames or extinguishing fires.
e. one or more pockets integrated into said apron body for storing utensils or other items.
f. reflective strips integrated into said apron body for enhanced visibility in low-light or smokey conditions.
g. an RFID tag chip or similar acting chip embedded within said apron body for tracking, safety compliance, and access restriction to designated working areas.
h. a washable and foldable design, resistant to oils and odours, available in various colour options and design styles; and
i. fire blanket tabs to facilitate industry compliance, easy gripping and releasing when applying the blanket over a cooking fire.

Claim 2. The combination of quick release apron, fire blanket, and attached heat-resistant mitts according to claim 1, wherein said fire-resistant apron body comprises a fire inherent material with a water-resistant coating on both sides.

Claim 3. The combination of quick release apron, fire blanket, and attached heat-resistant mitts according to claim 1, wherein said fastening mechanism comprises hook-and-loop fasteners, buckles, snaps, or other appropriate securing methods.

Claim 4. The combination of quick release apron, fire blanket, and attached heat-resistant mitts according to claim 1, wherein said heat-resistant mitts include an extra padded layer on the gripping side for prolonged heat exposure while maintaining tactile sensitivity.

Claim 5. The combination of quick release apron, fire blanket, and attached heat-resistant mitts according to claim 1, wherein said fire blanket feature includes two handles positioned above the middle of the front pocket, fire blanket tabs at the front, or utilisation of said heat-resistant mitts for comprehensive protection.

Claim 6. The combination of quick release apron, fire blanket, and attached heat-resistant mitts according to claim 1, wherein said fire-resistant apron body and heat-resistant mitts are made from reusable materials, promoting sustainability.

Claim 7. The combination of quick release apron, fire blanket, and attached heat-resistant mitts according to claim 1, wherein said pockets are made from fire-resistant material for increased protection.

Claim 8. The combination of quick release apron, fire blanket, and attached heat-resistant mitts according to claim 1, wherein said reflective strips are strategically placed on the front and or sides of said apron body to maximise visibility.

Claim 9. The combination of quick release apron, fire blanket, and attached heat-resistant mitts according to claim 1, wherein said RFID tag chip or similar acting chip enables structured fire safety management, safety compliance, and access control in designated working areas.

Claim 10. The combination of quick release apron, fire blanket, and attached heat-resistant mitts according to claim 1, wherein said washable and foldable design promotes practicality, durability, and ease of maintenance.

Claim 11. The combination of quick release apron, fire blanket, and attached heat-resistant mitts according to claim 1, suitable for various industries and applications including but not limited to food service, welding, metalworking, and glassblowing.

Claim 12. The combination of quick release apron, fire blanket, and attached heat-resistant mitts according to claim 1, offering a multifunctional solution that addresses the limitations of existing fire safety devices and provides a comprehensive, user-friendly approach to fire protection and takes into human account instincts and provides tool for effective fire suppression.

Each of Claims 2 to 12 depends on Claim 1.

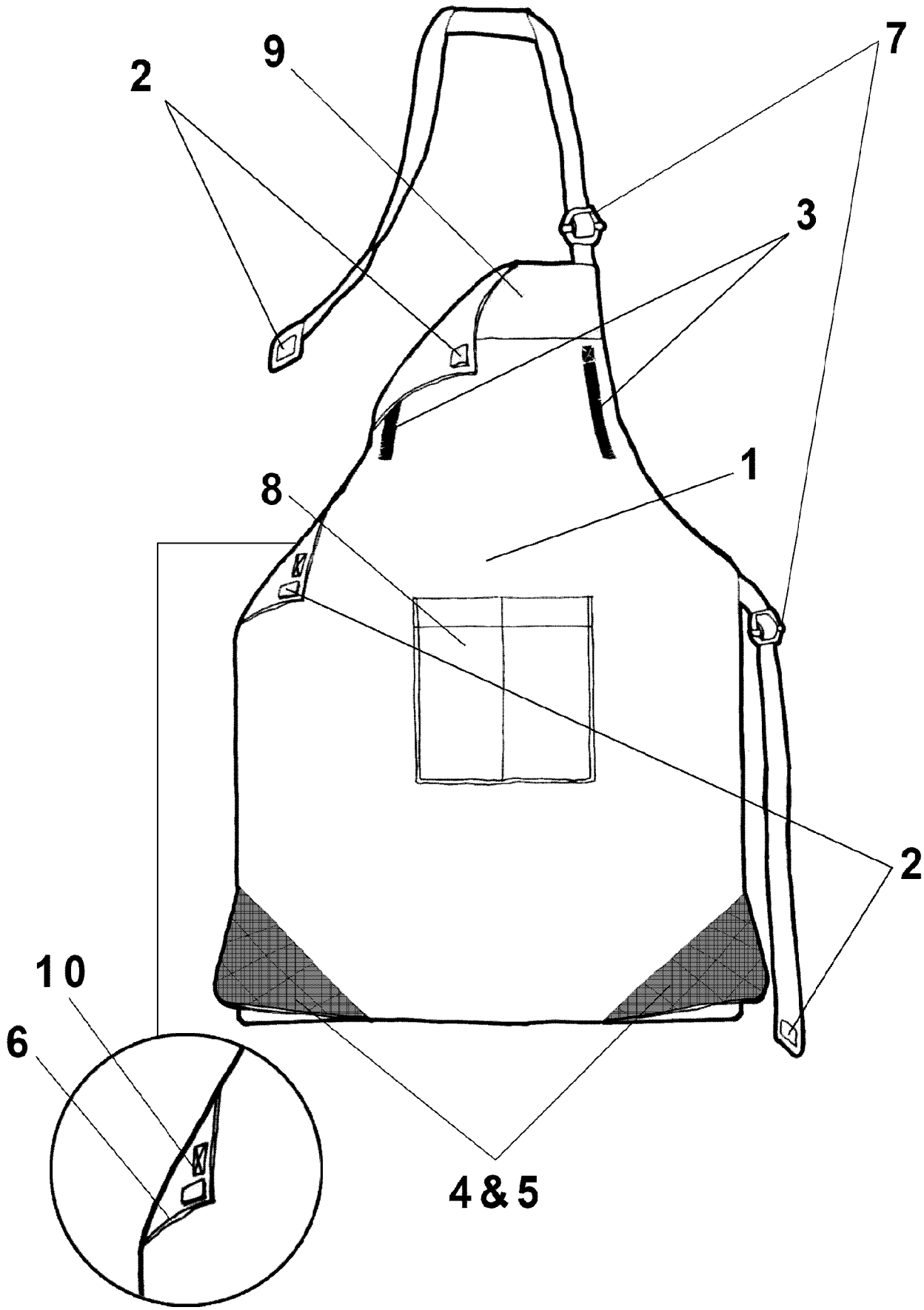

Figure 1(Front Side)

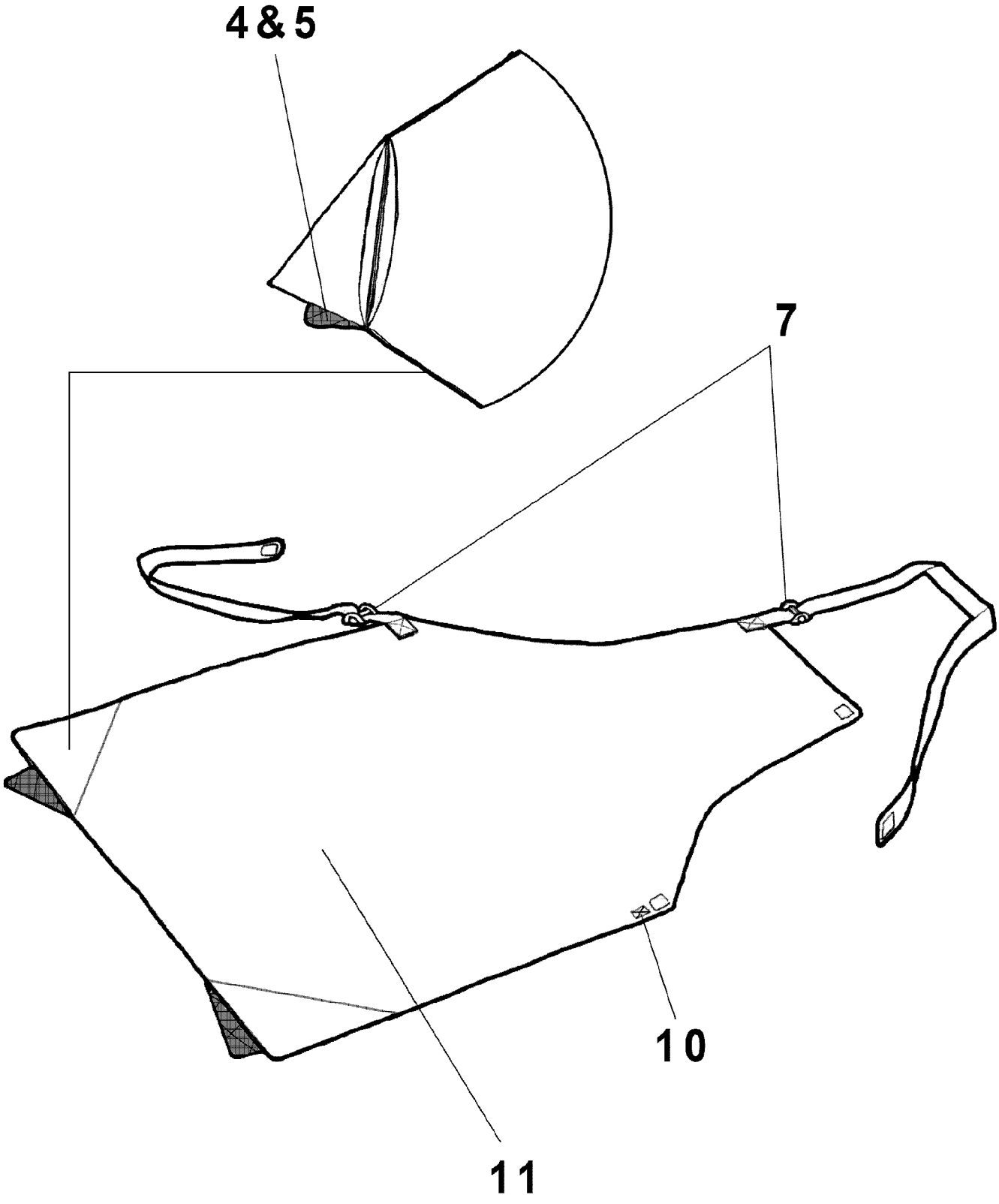

Figure 2 (Rear Side)

INTERNATIONAL SEARCH REPORT

International application No
PCT/GB2024/000030

A. CLASSIFICATION OF SUBJECT MATTER
INV. A62B17/00 A41D13/04 A62C8/06
ADD.

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
A62B A44C A62C A41D

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X Y	CN 212 679 897 U (WUHU NACHUAN FIRE ENG CO LTD) 12 March 2021 (2021-03-12) figures	1-8, 10-12 9
Y A	DE 10 2012 211449 B4 (DICK FRIEDR GMBH & CO KG [DE]) 16 January 2014 (2014-01-16) figures	9 1
X	JP S59 9018 U (UNDECIPHERABLE) 20 January 1984 (1984-01-20) figures	1-8, 10-12
X	JP S62 132121 U (UNDECIPHERABLE) 20 August 1987 (1987-08-20) figures	1-8, 10-12

☐ Further documents are listed in the continuation of Box C.

☒ See patent family annex.

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"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
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1

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/GB2024/000030

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
CN 212679897 U	12-03-2021	NONE	
DE 102012211449 B4	16-01-2014	NONE	
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JP S62132121 U	20-08-1987	NONE	