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(54) Protective suit.

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GB-A-2 110 069</p> | <p>(73) Proprietor: Tillbrook, Anthony Arthur Charles
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Description

This invention relates to protective clothing.

While the protective clothing according to the invention is primarily designed for use when windsurfing, and will be primarily described in connection with that activity, it will be understood that it is also usable for other aquatic activities, such as sailing.

It will be understood that windsurfing is a sport in which the expert hopes to avoid immersion but it is an everpresent risk, so that, particularly in cold weather, protective garments are normally worn.

Windsurfing garments have been adapted from diving suits which fall into two basic categories, namely dry suits and wet suits.

Dry suits for windsurfing are normally made of a light non-stretchable and non-insulating material. Underwear is normally worn for insulation. These types of suits are of one piece design and incorporate a waterproof zip for donning and divesting. A disadvantage of this kind of suit is that it relies solely on undergarments being worn for thermal insulation. They are also bulky and cumbersome and a windsurfer, in order to practice his sport, needs as much freedom of movement as can be obtained. Furthermore, if a windsurfer should fall into the water, large amounts of air inside his suit can cause difficulties in manouvering.

Windsurfing is a sport where style plays an important role. This style needs to be observed by judges of competitions and, as such, dry suits handicap the user in view of the possible prejudice engendered by the lack of aesthetic appeal of the large and shapeless suit.

There exist dry suits made from expanded neoprene for windsurfing, made as a one piece suit design. Entry is usually through a waterproof zip, and as the suit will give good insulation without relying upon undergarments and has a snug fit, it is aesthetically correct. Such suits are regarded as impractical as the snug fitting sleeves will restrict blood circulation in the arms and cause cramping.

There also exists now a dry suit primarily for windsurfing, forming the subject of my recently published U.K Patent Specification GB—A—2110069, wherein an expanded neoprene one piece suit, with entry usually through a waterproof zip, incorporates sleeves made of a waterproof fabric and adapted to be loose fitting. Thus warm air from the body portion of the suit may travel into the sleeves for some insulation and warming of the arms. Such suits do not restrict blood circulation in the arms.

A conventional wet suit is made from expanded neoprene and normally of a two piece design. This type of suit is worn tight to the user's body to minimise the flow of water within the suit since only limited quantities of water can flow between the suit and the wearer's body. This water soon warms to body temperature. However when the user leaves the water, particularly in windy condi-

tions, chilling is quite rapid so a wet suit is only suitable for limited periods of wear and for use in relatively warm conditions.

Wet suits exist with sleeves which are made of a waterproof fabric and adapted to be loose fitting. These are satisfactory until the wearer may fall into the water when large amounts of water will flood into the sleeves, chilling the wearer quite rapidly.

It is common in relatively warm conditions to wear only the body and leg portion of a wet suit, known as 'Long Johns', and to wear in addition the top portion, commonly known as a 'Bolero', when the wearer begins to chill. Such an arrangement is not totally satisfactory for windsurfing as water will continue to enter the suit once the wearer falls into the water.

According to the present invention there is provided a protective suit including a leg and body garment of foam rubber or rubber like material and an upper garment made from waterproof material to go over the arms and at least an upper part of the torso of the wearer, characterised in that the upper garment has a seal at the neck, in that the sleeves are of loose fitting waterproof material having seals at the wrists, and in that the upper garment also has a lower seal arrangement to form a seal around a body portion of the leg and body garment.

A leg and body portion, if worn on its own, would have the functions of the body and leg portion of a wet suit and would therefore be ideal for use in warm weather. The ankles of the body and leg portion may optionally be waterproofed by turning inwardly and tightening with straps if the wearer prefers to windsurf barefoot. Such an arrangement would stop any ingress of water from spray if travelling at speed in strong winds. A top portion incorporating a seal at the neck, wrist and waist and when worn with the body and leg portion would therefore render the combined garments waterproof and therefore ideal for use in cold weather.

Such an arrangement eliminates the need for expensive waterproofed sliding clasp fasteners, and donning and divesting of the garments requires only minimal assistance.

Preferably the sleeves are made of a breathable waterproof material, such as that sold under the trade name 'Goretex'. The sleeve portion may however be made of a non breathable fabric or of fabric coated with polyurethane.

The complete top portion or garment may be manufactured in 'Goretex' or other breathable or non-breathable material or of polyurethane material.

The top portion is preferably worn outside of the body and leg portion and sealed thereto at the chest, waist or hip.

Alternatively, the top portion may be worn inside the body and leg portion and sealed against the body portion thereof.

Sealing of the top portion to the body and leg portion can be achieved by overlapping two latex (or similar) seals and relying on the snug fit of the

two garments. The overlapped seals may be rolled together, e.g. round a bead at the edge of one of them. If required to give additional security, a cummerbund or belt which may be worn independently or may form part of the belt of the windsurfers trapeze harness or life jacket, may be useful to prevent the top portion from riding up in the event of a fall, at speed, into the water, and causing the seal to leak.

Sealing of the top portion to the body and leg portion may be by fixing a circular or alternative shape neoprene or other corresponding section to either of the garments and a corresponding channel to the other.

Riding up of the bolero may be overcome by extending the top portion of the hip level and by extending and shaping the back such that it may pass between the legs and fasten at the front.

The top portion may incorporate a collar to protect the neck seal and help to prevent heat loss at the neck. Such a configuration is included in my above mentioned GB—A—2110069.

Socks or bootees may be fitted to the leg and body portion.

A wet suit long john type leg and body portion is normally lined on the inside with a nylon or similar fabric which has the effect of reinforcing the foam material to give it tearing strength, lubricating the skin contact so as to make the garment easier to take on and off, and also providing some comfort next to the skin. It is normally considered disadvantageous for a lining of this nature to be on the outside surface of the suit since if it does get wet, the water tends to cling on and thereby increase the overall weight of the suit.

Although the use of awkwardly placed sliding clasp fasteners is avoided by use of a protective garment as described above, it has now been found that it is not normally possible for the wearer to remove the garment without any assistance, since it has proved difficult to apply enough manual force at the shoulders to pull the garment clear of the body.

It has now been discovered that if the upper part of the leg and body portion, or long john, is provided on its external surface with a nylon or similar fabric coating, then there is sufficient lubrication for the seal on the upper garment to slip fairly easily up the body so that the wearer may in fact remove the garment without assistance.

Accordingly, therefore, it is preferred that the leg and body garment has part of the body portion above the seal covered on the outside with a self lubricating fabric lining e.g. nylon.

It is also preferred that the inside of the upper part of the long john should be unlined since the long john is normally put on and taken off by sliding over the legs with the top portion being peeled off and folded down and donned in the reverse manner.

Provision of the rubber surface next to the skin is also advantageous in that it limits the amount of water getting into the long john should this be

worn without the upper protective garment and the wearer fall into the water.

The preferred arrangement is that the upper part of the long john should be made of the same material, i.e. nylon lined closed cell foam rubber or a rubber like material, as the rest of the long john, but reversed so that the lining is on the outside.

The arrangement described above is preferably used with the overlapping and rolled seals, with the bead being formed on the leg and body portion seal. In order to remove the garment, the seal is unrolled and the upper garment seal can then be slid over the nylon covered surface of the upper part of the long john. This required much less effort to be applied to the shoulders of the garment than would be the case if the seal were in contact with the rubber like surface.

The long john may be provided with a flap above the seal which may be used to conceal the seal when the latter is rolled up. Also, the upper garment may have means for tightening the flap against the long john below the seal, e.g. a belt or draw string to prevent the seal unrolling downwards.

The invention will be further described with reference to the accompanying drawing, in which:

Figure 1 is a diagram showing the general features of an upper protective garment;

Figure 2 is a diagram showing the features of a body and leg portion;

Figure 3 is a sectional view of part of a long john incorporating a flap;

Figure 4 is a view similar to Figure 3, with the seal rolled up and concealed.

Figure 5 is a view similar to Figure 3 showing in addition a portion of an upper garment with its flap folded back;

Figure 6 is a view similar to Figure 5 showing the seals rolled together and the flap folded down.

Figure 7 is a view similar to Figure 6 and showing a bolero having a drawstring.

Figure 8 is a further similar view showing how the drawstring may be made to anchor the bolero to the long john; and

Figure 9 is a view similar to Figure 1, also showing a bolero having a drawstring.

Figure 1 shows a bolero type garment having a body portion 1 which is made of neoprene or like foamed rubber like material. Sleeves 2 are formed of a breathable waterproof material such as 'Goretex', so as to be loose fitting. Wrist seals of a conventional type are shown at 3 and a neck seal at 4. A sealing strip of latex for cooperation with a sealing strip on the leg and body portion of a wet suit is shown at 5.

Turning now to Figure 2, the garment shown there is a generally conventional part of a wet suit and consists of body portions 6 and leg portions 7. Located in the waist region of the body portion 6 there is shown a strip of latex 8 for overlapping engagement by the sealing strip 5 of the garment shown in Figure 1. To make an effective seal, the

strips 5 and 8 are rolled together. This is easily done if the seals are a reasonably tight but yielding fit round the body of the wearer.

If required, seals may be fitted to the ankles of the leg portion 7, but it may be preferred merely to turn these in and strap them either against wearer's ankles or around bootees, in order to provide an effective seal.

Turning now to Figure 3, there is shown a layer 11 of closed cell foam material constituting part of a long john. The upper part of the long john has an external covering or lining 12 of nylon or similar fabric, closely adhering to it, and the lining or covering 12 is provided with an extension or flap 13 at its lower end. Attached to the layer 11 is a latex seal 14 which extends around the whole circumference of the wearers body in a generally horizontal position, and this seal terminates at its lower end with a bead 15. It will be seen that the seal 14 extends well below the flap 13, but in use, when the long john is being worn alone or with a wet suit or bolero which is not sealed to the long john, then the seal 14 is normally rolled up around its bead 15 so that it takes the form shown in Figure 4 in which the seal is concealed beneath the flap 13.

Such an arrangement leads to an improvement in the appearance of the garment in use.

Turning now to Figure 5, the portions of the long john shown in Figure 5 are shown in conjunction with the lower portion 16 of an upper garment. The portion 16 has a latex seal 17 to cooperate with the seal 14 to form a dry suit, and the lower portion further has an extension or flap 18 which in Figure 5 is shown folded upwardly to enable access to the seals 14 and 17.

In Figure 4, the seals 14 and 17 are shown rolled together around the bead 15 to form the waterproof seal between the two garments, and the flap 18 is shown as being folded down to its natural position to conceal the rolled up seals.

In this position, the lower portion of the flap 18 is normally to be tightened onto the long john, e.g. by means of a belt or draw string so that unrolling of the two seals is prevented and the water tightness thus maintained even under adverse operating conditions or movements of considerable violence.

The belt may be applied through fairly conventional external loops (not shown). A draw string 22 can be threaded through a rolled bottom edge 21 (see Figures 7 and 8) of the flap 18 and exposed at the front through two eyelets and can then be pulled tight by means of a toggle on the end of the draw string 22 which can then be secured in position.

Figure 9 shows ends 23 of the drawstring 22 drawn through a toggle having a body 24 and a spring loaded plunger 25 which may be depressed manually to allow the drawstring 23 to run through the plunger and body, and when released, effectively clamp the drawstring to the body.

Figure 8 shows how the rolled bottom edge 21

may be interrupted in the region of the small of the wearer's back, so that a length 26 of the drawstring may be drawn out and engaged to a hook of the catch 27 on the long john. This enables anchoring of the garment 1 to the long john and also prevents unrolling of the seals at an area where the seals might become partially vulnerable to loosening and unrolling. The hook on catch 27 is shown as being associated to flap 28 to minimise chafing of the seal when the suit is not being worn.

It is envisaged that the upper part of the long john may be lined both inside and out with the nylon fabric to provide both comfort for the wearer and also the ease of removal.

It is to be noted that the seals between the two garments are both fairly close fitting to the wearer's body so that the seals are easily rolled together and also the appearance of the garment is good from a stylistic point of view.

The upper garment 16 may be of foam material with loose sleeves, but in some circumstances it may be desirable for it to be formed wholly of loose material, e.g. the breathable material known as 'Goretex'.

Claims

1. A protective suit including a leg and body garment (6, 7) of foam rubber or rubber like material and an upper garment (1, 2) made from waterproof material to go over the arms and at least an upper part of the torso of the wearer, characterised in that the upper garment (1, 2) has a seal (4) at the neck, in that the sleeves (2) are of loose fitting waterproof material having seals (3) at the wrists, and in that the upper garment also has a lower seal (5, 17) arrangement to form a seal around a body portion (6) of the leg and body garment.

2. A protective suit according to claim 1, characterised in that the sleeves (2) are of a breathable material.

3. A protective suit according to either of the preceding claims, characterised in that the neck seal (4) is protected by a collar.

4. A suit according to any of the preceding claims characterised in that the leg and body garment (6, 7) has a seal configuration (8, 14) to cooperate with the lower seal (5, 17) of the upper garment (1, 2).

5. A suit according to any of claims 1 to 4, characterised in that the leg and body garment (6, 7) has part of the body portion (6) above the seal (5, 17) covered on the outside with a self-lubricating fabric material, such as nylon.

6. A suit according to any of the preceding claims, characterised in that the leg and body garment (6, 7) and/or the upper garment (1, 2) is/are provided with a flap (13, 18) above the seal (14, 17), which flap may be used to conceal the seal when the latter is rolled up.

7. A suit according to claim 6, characterised in that the upper garment (1, 2) is provided with means (22) for drawing the flap (18) tight below

the rolled up seal (14, 17) to prevent unrolling of the seal (14, 17).

8. A suit according to Claim 7, characterised in that the tightening means is a drawstring (22) located in a turned up edge (21) of the upper garment (1, 2) and arranged to be clamped to a toggle (24).

9. A suit according to claim 8, characterised in that the leg and body garment (6, 7) has a hook in catch (27) located in the region of the small of the wearer's back to engage a length (26) on to drawstring (22) to anchor the upper garment (1, 2) on to leg and body garment (6, 7).

Patentansprüche

1. Schutzanzug, umfassend einen Bein- und Körperbekleidungsteil (6, 7) aus Schaumgummi oder gummiähnlichen Material und einen Oberbekleidungsteil (1, 2), der aus wasserdichtem Material hergestellt ist und über die Arme und wenigstens einen oberen Teil des Rumpfes des Trägers reicht, dadurch gekennzeichnet, daß der Oberbekleidungsteil (1, 2) eine Dichtung (4) zum Nacken aufweist, daß die Ärmel (2) aus lose sitzendem, wasserdichtem Material mit Dichtungen (3) zu den Handgelenken bestehen, und daß der Oberbekleidungsteil weiters eine untere Dichtungsanordnung (5, 17) aufweist, um eine Dichtung um den Körperbereich (6) des Bein- und Körperbekleidungsteiles zu bilden.

2. Schutzanzug nach Anspruch 1, dadurch gekennzeichnet, daß die Ärmel (2) aus atmungsaktivem Material bestehen.

3. Schutzanzug nach einem der voranstehenden Ansprüche, dadurch gekennzeichnet, daß die Nackendichtung (4) durch einen Kragen geschützt ist.

4. Anzug nach einem der voranstehenden Ansprüche, dadurch gekennzeichnet, daß der Bein- und Körperbekleidungsteil (6, 7) eine Dichtungsausbildung (8, 14) aufweist, die mit der unteren Dichtung (5, 17) des Oberbekleidungsteiles (1, 2) zusammenwirkt.

5. Anzug nach einem der Ansprüche 1 bis 4, dadurch gekennzeichnet, daß beim Bein- oder Körperbekleidungsteil (6, 7) ein Teil des Körperabschnittes (6) oberhalb der Dichtung (5, 17) auf seiner Außenseite mit einem selbstschmierenden Gewebematerial, z.B. Nylon, bedeckt ist.

6. Anzug nach einem der voranstehenden Ansprüche, dadurch gekennzeichnet, daß der Bein- und Körperbekleidungsteil (6, 7) und/oder der Oberbekleidungsteil (1, 2) mit einem Lappen (13, 18) oberhalb der Dichtung (14, 17) versehen ist/sind, welcher Lappen zur Abdeckung der Dichtung verwendet werden kann, wenn die Dichtung aufgerollt ist.

7. Anzug nach Anspruch 6, dadurch gekennzeichnet, daß der Oberbekleidungsteil (1, 2) mit Mitteln (22) zum dichten zusammenziehen des Lappens (18) unterhalb der aufgerollten Dichtung (14, 17) versehen ist, um ein Abrollen der Dichtung (14, 17) zu verhindern.

8. Anzug nach Anspruch 7, dadurch gekennzeichnet, daß die Zugmittel eine Zugschnur (22) umfassen, die in einer umgeschlagenen Kante (21) des Oberbekleidungsteiles (1, 2) angeordnet und so ausgebildet ist, daß sie mittels eines Knebels (24) festgeklemmt werden kann.

9. Anzug nach Anspruch 8, dadurch gekennzeichnet, daß der Bein- und Körperbekleidungsteil (6, 7) einen Fanghaken (27) aufweist, der in dem schmalen Bereich des Rückens des Trägers angeordnet ist, um an einem Abschnitt (26) der Zugschnur (22) anzugreifen, um den Oberbekleidungsteil (1, 2) an dem Bein- und Körperbekleidungsteil (6, 7) zu verankern.

Revendications

1. Combinaison de protection comprenant un vêtement pour les jambes et le corps (6, 7) en mousse de caoutchouc ou en matériau caoutchouteux similaire et une partie haute de vêtement (1, 2) réalisée en un matériau étanche à l'eau pour couvrir les bras et au moins une partie supérieure du torse de l'utilisateur, caractérisée en ce que la partie haute de vêtement (1, 2) comporte une fermeture hermétique (4) au niveau du cou, en ce que les manches (2) sont en un matériau étanche à l'eau avec un ajustement ample et comportent des fermetures hermétiques (7) aux poignets, et en ce que la partie haute de vêtement comporte également une fermeture hermétique (5, 17) inférieure pour établir une étanchéité autour de la partie de corps (6) du vêtement pour les jambes et le corps.

2. Combinaison de protection selon la revendication 1, caractérisée en ce que les manches (2) sont en un matériau qui peut respirer.

3. Combinaison de protection selon l'une quelconque des revendications précédentes, caractérisée en ce que la fermeture hermétique de cou (4) est protégée par un col.

4. Combinaison de protection selon l'une quelconque des revendications précédentes, caractérisée en ce que le vêtement pour les jambes et le corps (6, 7) a une configuration d'étanchéité (8, 14) pour coopérer avec la fermeture hermétique inférieure (5, 17) de la partie haute de vêtement (1, 2).

5. Combinaison de protection selon l'une quelconque des revendications 1 à 4, caractérisée en ce que le vêtement pour les jambes et le corps (6, 7) comporte une région de la partie de corps (6) située au-dessus de la fermeture hermétique (5, 17) couverte extérieurement par un tissu auto-lubrifiant, tel que du nylon.

6. Combinaison de protection selon l'une quelconque des revendications précédentes, caractérisée en ce que le vêtement pour les jambes et le corps (6, 7) et/ou la partie haute de vêtement (1, 2) est/sont munis d'un pan (13, 18) au-dessus de la fermeture hermétique (14, 17), lequel pan peut être utilisé pour dissimuler la fermeture lorsque cette dernière est enroulée.

7. Combinaison de protection selon la revendication 6, caractérisée en ce que la partie haute de vêtement (1, 2) est munie de moyens (22) pour serrer le pan (18) au-dessous de la fermeture enroulée (14, 17) pour empêcher un déroulement de la fermeture (14, 17).

8. Combinaison de protection selon la revendication 7, caractérisée en ce que le moyen de serrage est un cordon (22) situé dans un bord retourné (21) de la partie haute de vêtement (1, 2)

et disposé de manière à être bridé par un dispositif de blocage (24).

9. Combinaison de protection selon la revendication 8, caractérisée en ce que le vêtement pour les jambes et le corps (6, 7) comporte un crochet d'agrafe (27) situé dans le creux des reins de l'utilisateur pour s'engager sur une longueur (26) du cordon (22) afin d'ancrer la partie haute de vêtement (1, 2) sur le vêtement pour les jambes et le corps (6, 7).

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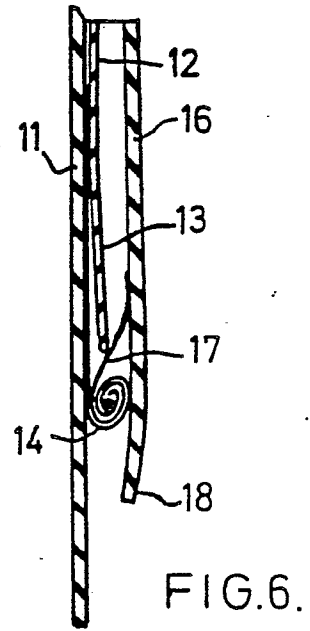
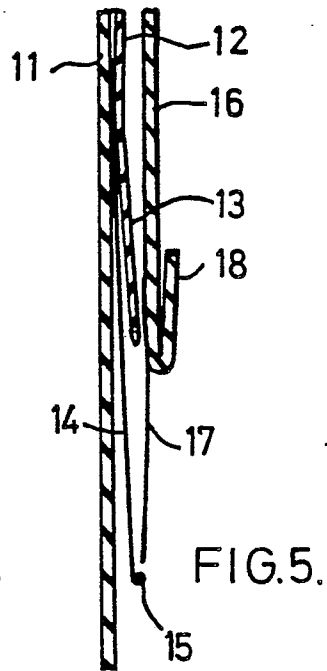
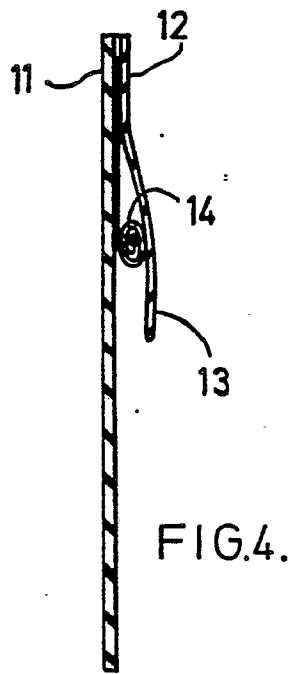
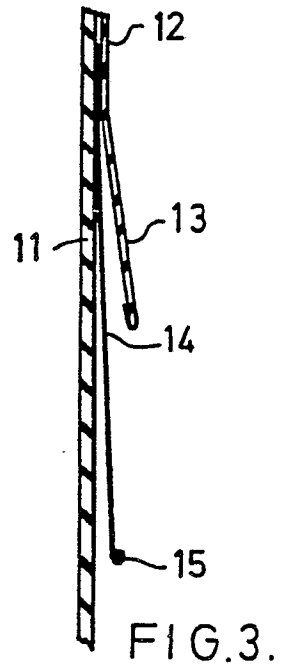
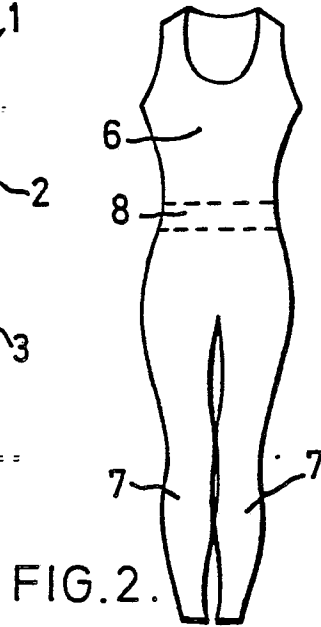
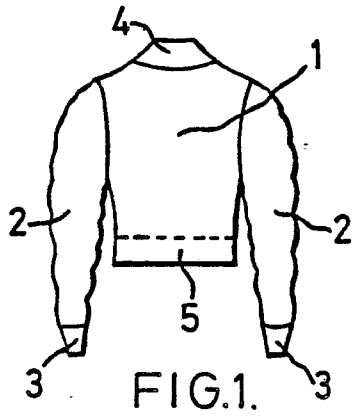
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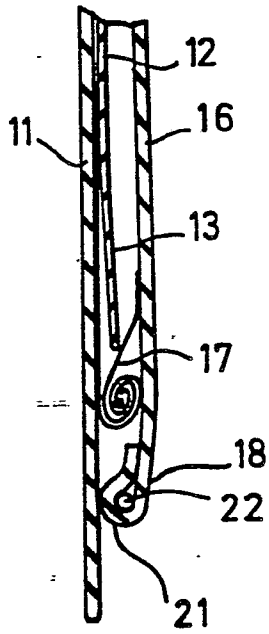


FIG. 7.

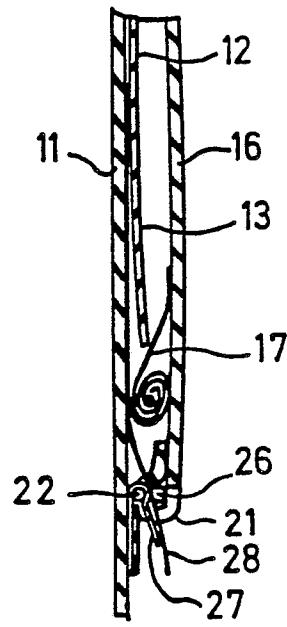


FIG. 8.

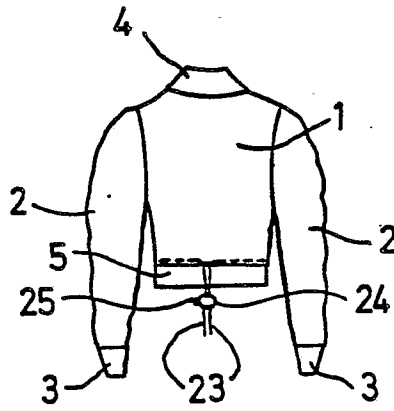


FIG. 9.