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(56) Documents Cited
GB 2310788 A GB 2262216 A

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(54) Cyclist's glove

(57) A cycling glove which improves the safety of cyclists riding at night or in conditions of low visibility. The cycling glove comprises an outside layer (11) provided with light source means (17, 18, 19, 20) and further comprising activation means, wherein the activation means comprises a contact switch (25) accommodated beneath the outside layer (11) between a hand entered into the glove and the outside layer.

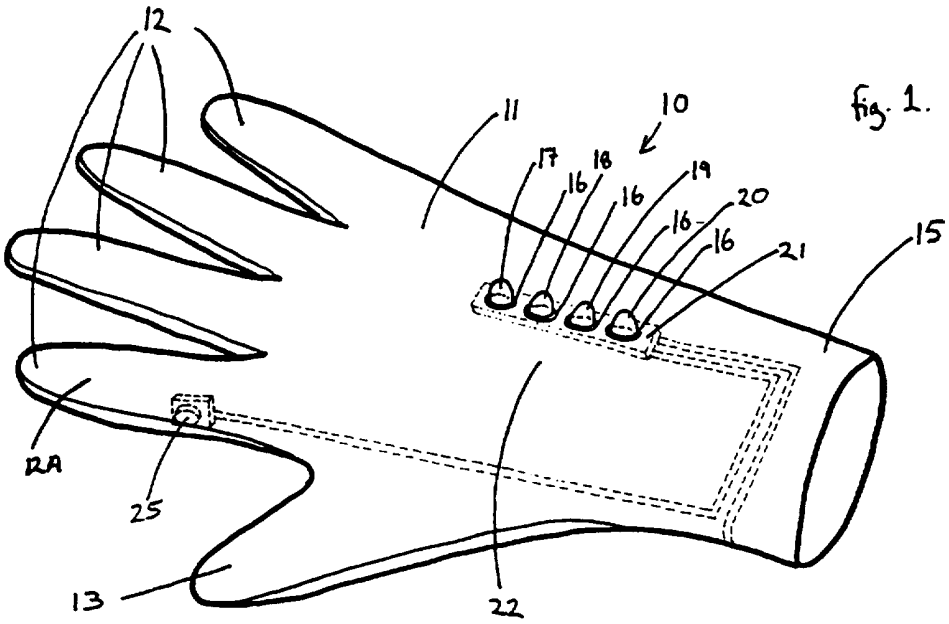

fig. 1.

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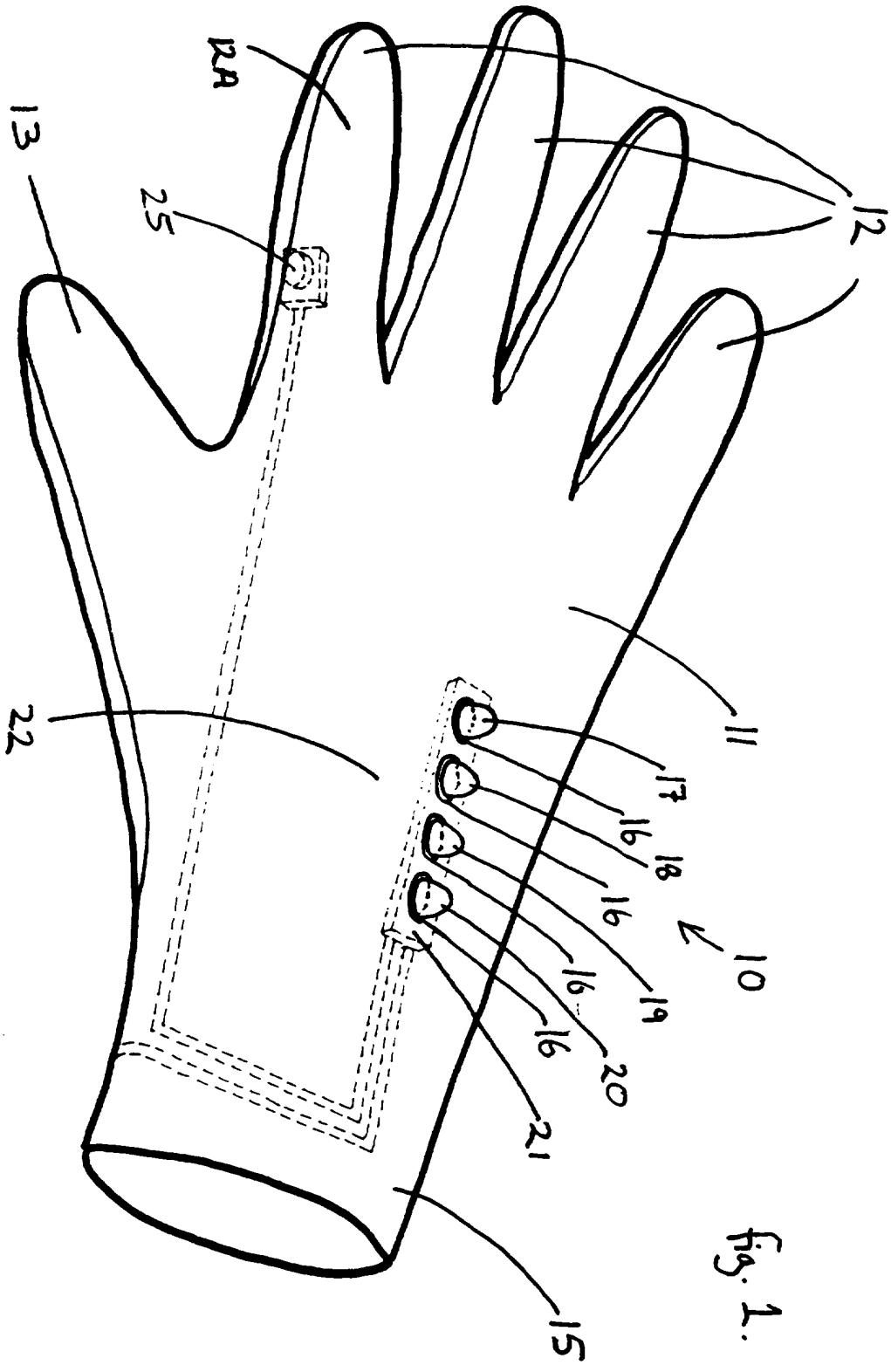

fig. 1.

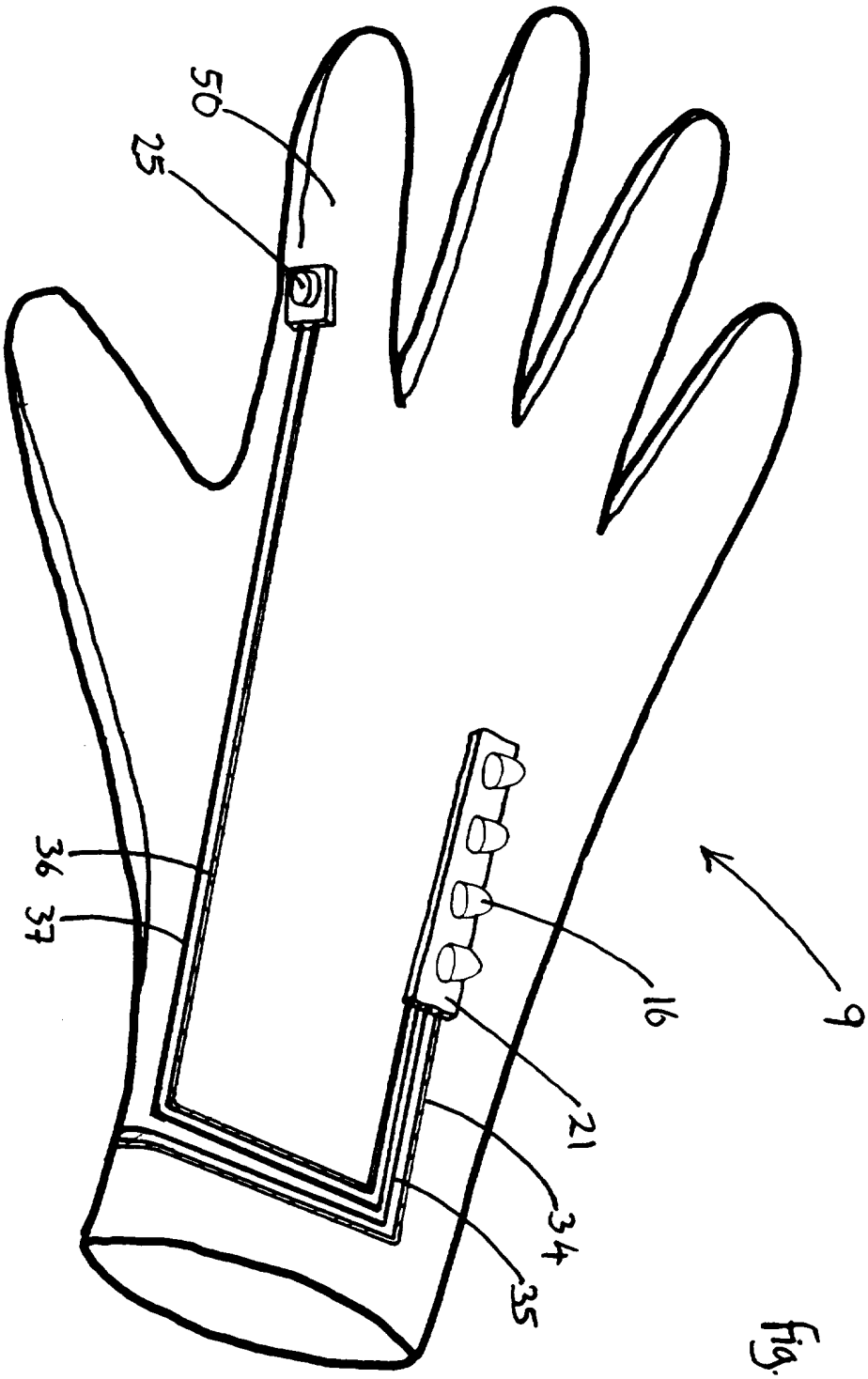

Fig. 2.

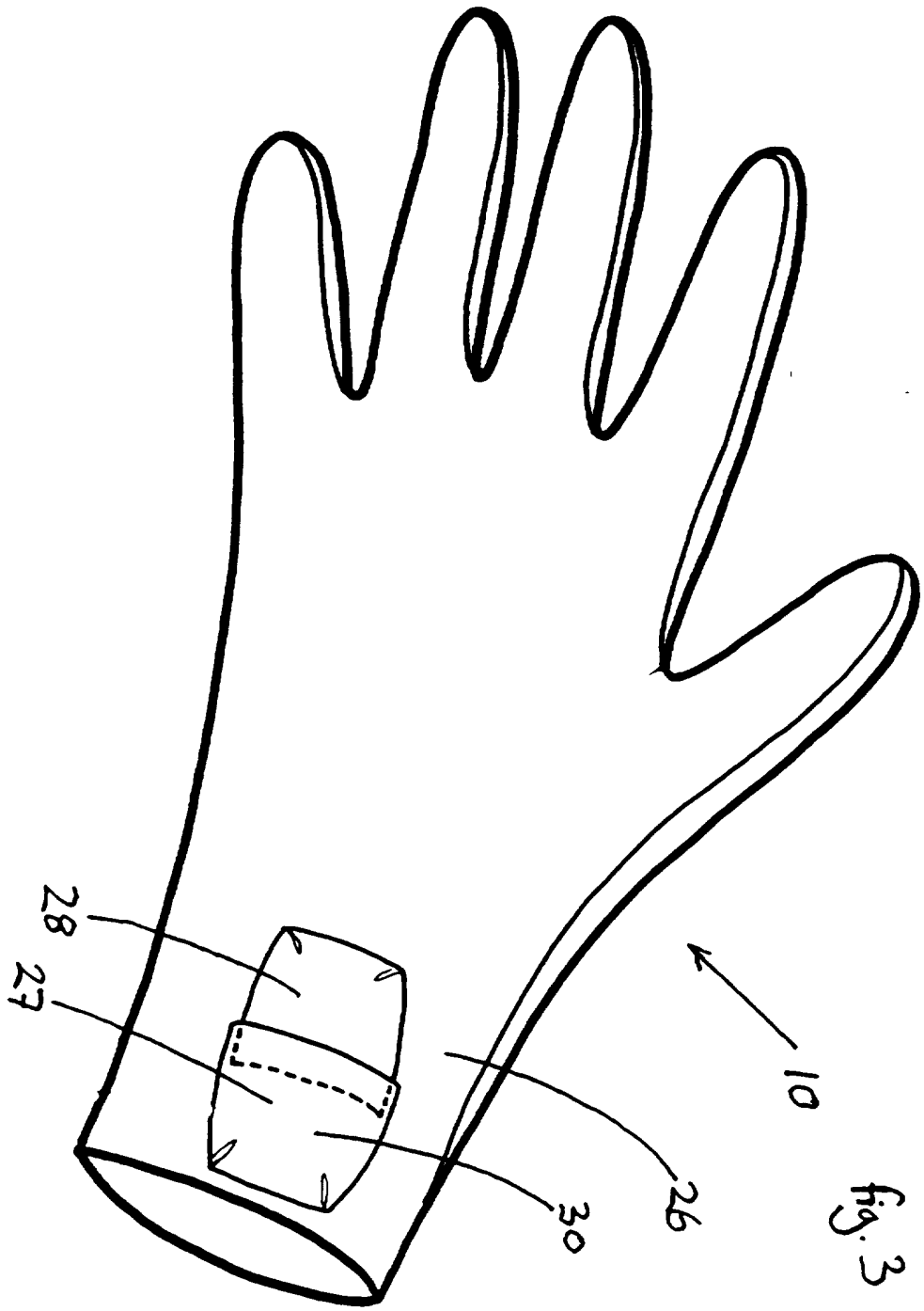

fig. 3

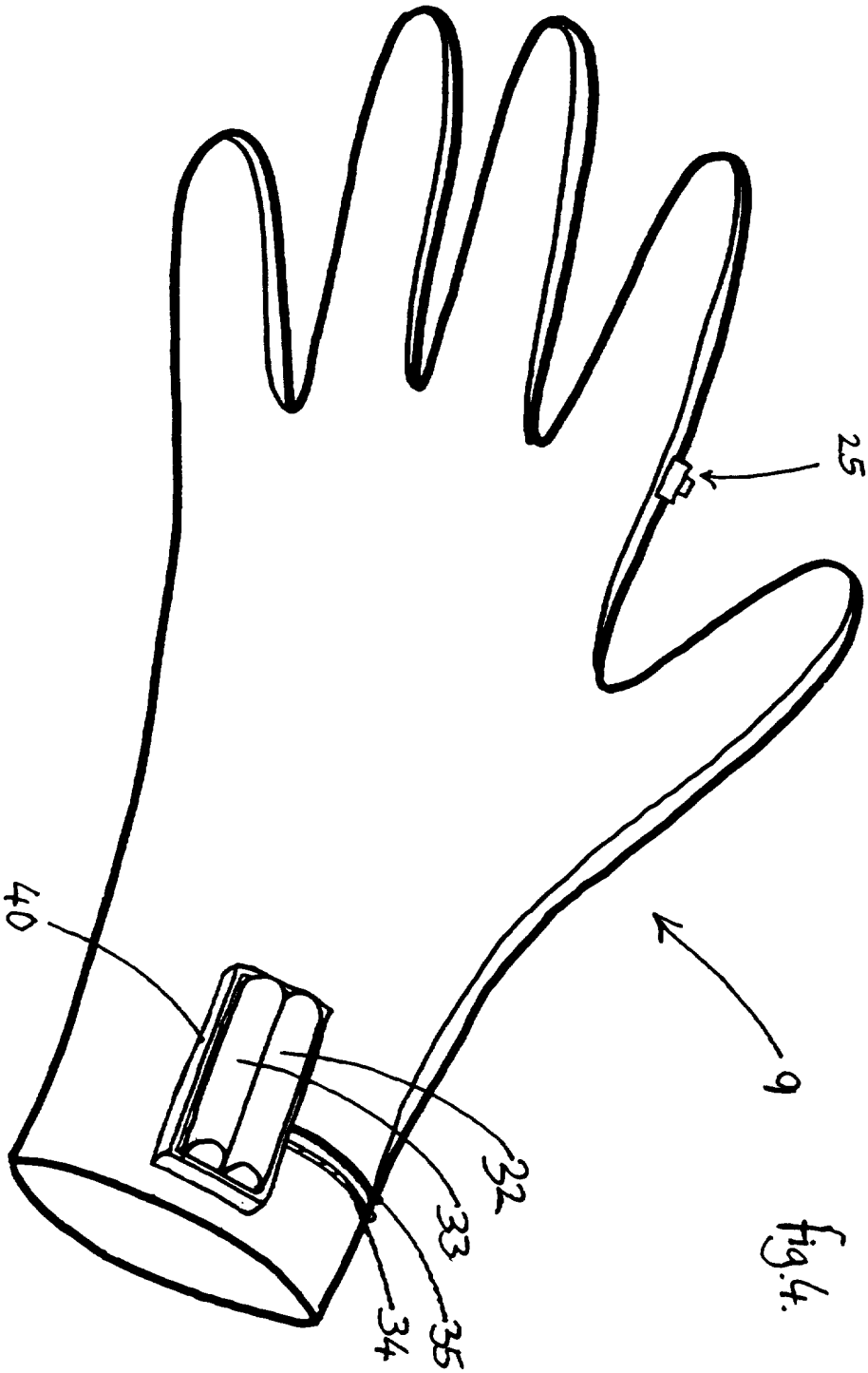

Fig.4.

CYCLIST'S GLOVE

The present invention concerns the field of cycling and in particular relates to a method of improving the safety of cyclists riding at night or in conditions of low visibility.

Cyclists are required by law to have working front and rear lights on their bicycles after dark. It is unusual for cycles to have the amber indicator lights found on powered vehicles and by which a visual indication of a change in direction may be given to following or oncoming traffic. Because of this a cyclist travelling at night or in low visibility conditions is particularly vulnerable when turning. The usual method of indicating to traffic that the cyclist is turning is to outstretch an arm in the direction to be turned. Needless to say, at night it is not easy to see such an indication, especially where street lighting is inadequate or absent, or where the cyclist has dark clothing.

East German patent application DD-A-233 351 discloses a hand strap upon which is mounted a light bulb activated a lever switch. The illuminated bulb increases a cyclist's visibility, but the apparatus is fiddly to attach to, and remove from, the user's hand. furthermore the bulb is exposed and therefore easily damaged while the lever switch is bulky and prevents

normal use of the hand during cycling.

United Kingdom patent application GB-A-2 274 156 discloses a signalling glove which is easy to wear and provided with an LED signalling light activated by pressing together two metal eyelets, one carried on a thumb portion of the glove and the other carried adjacent the knuckle of the index finger of the glove. The glove is less restrictive on the user than the earlier German glove described above, but the light activation mechanism is rather inconvenient and unreliable because it involves touching together two very small eyelets, and maintaining contact while the light is intended to be on. The eyelets themselves are open to the elements and prone to contamination by water and dirt. Furthermore the light is prone to accidental activation where both eyelets come into contact with metal handlebars.

United Kingdom patent specification GB-B-2 262 216 discloses a cycling mitt which is equipped with audible buzzers and lights. A trigger switch for the buzzers and lights is located on a surface portion of the glove. In one embodiment a trigger switch is located on an underside of the glove finger sheath in which is located the index finger. The switch is however open to the elements and susceptible to accidental activation and/or snagging by virtue of its location on the surface of the glove.

It is an object of the present invention to provide an improved method of signalling for the safety of cyclists which does not suffer from the disadvantages of the prior art discussed in the foregoing.

According to the present invention there is provided a cycling glove comprising an outside layer provided with light source means and further comprising activation means for the light source means, wherein the activation means comprises a contact switch accommodated beneath the outside layer between a hand entered into the glove and the outside layer, the arrangement being such that the switch is protected from contamination by dirt or grime or the elements.

In this way the reliability of operation of the glove/mitt is enhanced because failure due to the ingress of, and contamination by, water, dirt and grime is prevented. Indeed the warmth of the hand entered in to the glove prevents freezing. In addition the outside surface of the glove in the region of the switch can remain generally smooth thereby preventing snagging or accidental activation of the device. This also gives the glove the appearance and utility of a standard glove or mitten.

By "glove" as used herein it is intended to include all well known articles of hand clothing such as conventional gloves, mittens in which two or more

fingers of a hand are accommodated in single sheaths, and mitts in which the conventional finger and thumb end portions of a glove are absent.

Preferably the light source means is adapted to be activated and deactivated by sequential pressure applied to the contact switch. In a preferred embodiment the contact switch comprises a push button which provides a positive click to indicate operation thereby to provide feed back to the cyclist of the activation state of the light source.

In the above arrangement the outstretched cyclists hand may be rendered visible by activation of the light source. The light source may also be used while the hands are on the handlebars if it is not safe to remove them during cycling. The contact switch operation ensures that a simple one touch control is capable of activating and deactivating the light source means. Activation or deactivation may be by movement of the activation means against a handlebar portion or by finger or thumb applied pressure. The glove of the present invention has been designed for use by cyclists but could find application in other areas where visibility of the hands is desirable or important, e.g. traffic direction.

The glove or mitten may comprise an inner lining layer in which case the push button activation means may be accommodated between the lining

layer and the outer layer. Preferably any internal wiring is also accommodated between the inner and outer layers to prevent snagging thereof.

Preferably a portion of the outer layer adjacent the contact switch is adapted to reduce wear and tear of the outer layer in that region, such as by comprising, or being reinforced by, a resilient plastics material cap which permits operation of the button, but which preferably prevents dirt or water entering the button mechanism.

The activation means is preferably located adjacent the index finger of a hand inserted in the glove or mitten, the arrangement being such that the activation means may be operated by pressure applied thereon by the thumb of the same hand or by urging the index finger against handlebars of a cycle.

The light source means may be located on a backside portion of the glove or mitten. The light source means may comprise one or more light emitting diodes. Preferably the light source means may comprise a plurality of light emitting diodes arranged in a line. The light source means may be carried on a backing layer, which backing layer is accommodated between the outside layer of the glove and an inner lining layer.

The outer layer may be provided with one or more apertures through each of which one of the light emitting diodes is visible. The one or more apertures may each comprise a hole in the outer layer which serves to locate a light emitting diode in position and permits the diode to stand proud of the outer layer.

The outer layer may be provided with removable protective cover means for the light source means, which cover means is adapted to overlay the light source and prevent damage to the light source by abrasion or impact when the glove is used as a glove per se rather than for signalling. In one embodiment the cover means comprises a flap of flexible material attached at one side to the outer layer and at another side by a releasable fastener such as a velcro connection. The flap is adapted to lie to one side, away from the light source, when the fastener is released. The cover means allows the glove to be used as a conventional glove both in utility and appearance when not being used for signalling.

The light source means may be adapted to produce an intermittent or flashing light output. The light source means may be sequentially switchable between one or more flashing / intermittent settings, a steady setting and an off setting.

A power source for the light source may be accommodated in a wrist band of the glove. The power source may comprise solid state batteries.

The outer layer of the glove or mitten is preferably comprised of a substantially waterproof and breathable material thereby to protect any electronic and electric components against water ingress while permitting water vapour to escape and maintaining user comfort. Any inner layer preferably comprises a thermally insulating material.

Following is a description by way of example only and with reference to the figures of the drawings of a method of putting the present invention into effect.

Figure 1 is a perspective view from one side and above of the top side of a right handed glove according to the present invention.

Figure 2 is a perspective view from one side and above of the top side of a glove liner to be disposed inside the glove of figure 1.

Figure 3 is a perspective view from one side of the under (or palm) side of the glove shown in figure 1.

Figure 4 is a perspective view of the under side of the liner shown in figure 2.

A glove according to one embodiment of the present invention is shown generally as 10 in figure 1. The glove comprises an outer layer 11 of a waterproof and breathable fabric material such as Gortex (TM). The outer layer is configured in the form of a conventional glove with four fingers 12 and a thumb 13. The glove has cuff or wrist band portion 15 provided with an elasticated tightening band (not shown) which ensures a snug fit around the wrist of a hand entered in to the glove. An upper portion 22 of the outside layer 11 is formed with a line of four spaced apart circular holes 16. In each of these holes is located a light emitting diode 17,18,19 and 20. Each diode is soldered to an elongate flat PCB (printed circuit board) back plate 21 shown in dashed lines in the figure and accommodated underneath and generally parallel to the plane of the upper portion 22 of the outer layer. The PCB is positioned between the knuckle and the wrist of the hand. In this location the hand is flat, and remains so during movement of the hand. Thus there is no tendency for the delicate PCB to be bent or stressed during normal use of the glove.

The index finger 12A of the glove is provided with a push button 25 shown in dashed lines in figure 1. The push button is disposed underneath the

outer layer 11 at a location corresponding to the thumb 13 side of the knuckle of the index finger, as shown in figure 1. The push button is fixed in position by gluing or sewing to create a suitable pocket.

A glove liner 9 is shown in figure 2. The liner is of a shape corresponding to that of the glove 10, but of slightly reduced dimensions so that it may be entered into and accommodated inside the glove. The liner is made from synthetic insulating material. The PCB 21 is attached to the liner, conveniently by gluing or stitching. The push button 25 is similarly attached, to the knuckle of the index finger sheath 50 of the liner.

In figure 3 an underside 26 of the wrist portion 15 of the glove is shown formed with a pocket 30 which defines internally thereof a compartment in which is removably retained two AAA-type batteries 32 and 33. The batteries are carried in a tray 40 attached to the glove liner 9 as shown in figure 4. The pocket portion comprises a first portion 27 which is adapted to co-operate for releasable engagement with a second portion 28 so that the batteries may be replaced when expended.

Electrical connections between the batteries and the light emitting diodes are made by wires 34 and 35 (the positions of which are shown as dashed lines in figure 1). Electrical connections between the light emitting diodes

and the push button are made by wires 36 and 37. A logic circuit (not shown) forms part of the PCB 21 and controls and regulates signals sent to the light emitting diodes according to activation states selected by the push button. The activation states in this embodiment are: OFF; flashing ON; OFF etc.

In use the cyclist wears a pair of gloves described in the foregoing (adapted for left and right hand use as appropriate). When it is desired to execute a left turn, the push button on the left hand is pressed, typically by squeezing the knuckle of the index finger against the cycle's handlebar, and the LED's begin to flash. The arm is then outstretched to the left with the upper portion of the glove carrying the LED's facing the rear of the cyclist, thereby indicating to following traffic the direction change the cyclist will make. When the manoeuvre has been completed the hand is returned to the handle bar and the knuckle squeezed against the handlebar to press the push button and return the LED's to the OFF state. Naturally, the glove can also be used to indicate to oncoming traffic by holding the upper surface of the glove towards the oncoming traffic.

CLAIMS

1. A cycling glove comprising an outside layer provided with light source means and further comprising activation means for the light source means, wherein the activation means comprises a contact switch accommodated beneath the outside layer between a hand entered into the glove and the outside layer, the arrangement being such that the switch is operable by pressure applied on the switch and the switch is protected from contamination by dirt or grime or the elements.

2. A cycling glove as claimed in claim 1 wherein the light source means and / or activation means is / are adapted to permit sequential activation and deactivation of the light source by sequential pressure applied to the contact switch.

3. A cycling glove as claimed in claim 1 or claim 2 and comprising an inner lining layer and wherein the contact switch is accommodated between the lining layer and the outer layer.

4. A cycling glove as claimed in claim 2 or claim 3 wherein a portion of the outer layer adjacent the contact switch is reinforced to reduce

wear and tear of the outer layer in that region.

5. A cycling glove as claimed in claim 4 wherein the said portion is reinforced by a resilient plastics material cap.

6. A cycling glove as claimed in any of the preceding claims wherein the contact switch is located adjacent the forefinger of a hand inserted in the glove, the arrangement being such that the light source may be operated by pressure applied on the contact switch by the thumb of the same hand or by urging the forefinger against handlebars of a cycle.

7. A cycling glove as claimed in any preceding claim wherein the light source means comprises one or more light emitting diodes.

8. A cycling glove as claimed in any preceding claim wherein the light source means comprises a plurality of light emitting diodes arranged in a line.

9. A cycling glove as claimed in claim 7 or claim 8 wherein the light source means is carried on a backing layer, which backing layer is accommodated between the outside layer of the glove and an inner

lining layer.

10. A cycling glove as claimed in claim 9 wherein the outer layer is provided with one or more apertures through each of which one of the light emitting diodes is visible.

11. A cycling glove as claimed in claim 10 wherein the one or more apertures each comprise a hole in the outer layer which serves to locate a light emitting diode in position and permits the diode to stand proud of the outer layer.

12. A cycling glove as claimed in any preceding claim wherein the light source means is adapted to produce an intermittent or flashing light output.

13. A cycling glove as claimed in claim 12 wherein the light source means is switchable to between flashing / intermittent setting and a steady light out put state.

14. A cycling glove as claimed in any preceding claim wherein a power source for the light source is accommodated in a wrist band of the glove.

15. A cycling glove as claimed in any preceding claim wherein the outer layer is comprised of a substantially waterproof and breathable material thereby to protect any electronic and electric components against water ingress while permitting water vapour to escape and maintaining user comfort.

16. A cycling glove as claimed in any preceding claim wherein the contact switch comprises a push button which provides a positive click indication of activation / deactivation.

17. A cycling glove as claimed in any preceding claim wherein the outer layer is provided with removable protective cover means for the light source means, which cover means is adapted to overlay the light source and prevent damage to the light source by abrasion or impact when the glove is used as a glove per se rather than for signalling.

18. A cycling glove as claimed in claim 17 wherein the cover means comprises a flap of flexible material, one edge portion of which is attached to the outer layer and another edge portion of which is provided with a releasable fastener, such as a velcro connection, for fastening or release of the flap to / from the outer layer.

19. A cycling glove as hereinbefore described and with reference to the drawings.

The Patent Office

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Application No: GB 9717753.9
Claims searched: 1-19
Examiner: Jason Clee
Date of search: 11 November 1997

Patents Act 1977
Search Report under Section 17

Databases searched:

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:

UK Cl (Ed.O): E1G - GLR, A3V

Int Cl (Ed.6): A41D & F21L

Other: Online: WPI

Documents considered to be relevant:

Category	Identity of document and relevant passage		Relevant to claims
X,E	GB 2,310,788 A	Edward Aldert Christopher de Jong	1, 2, 6-8, 12 & 15-17
X	GB 2,262,216 A	Chung-Piao Tsao	1 & 16

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application.