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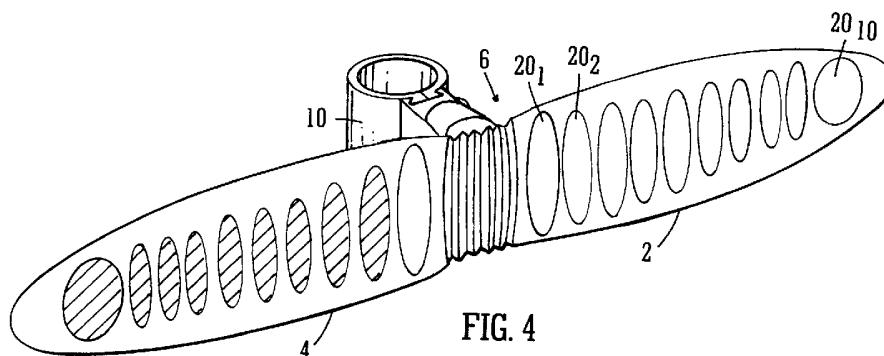
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DE 019926565 A1 **FR 001165461 A**
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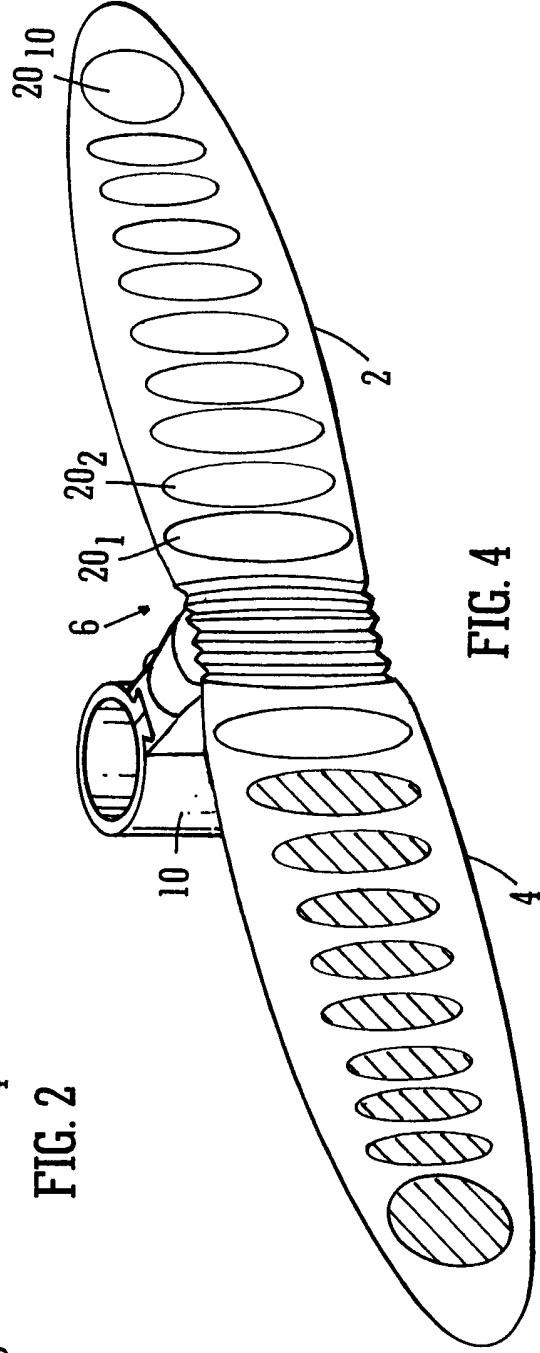
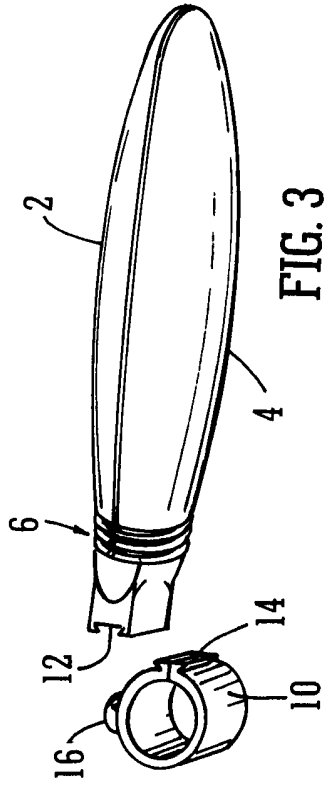
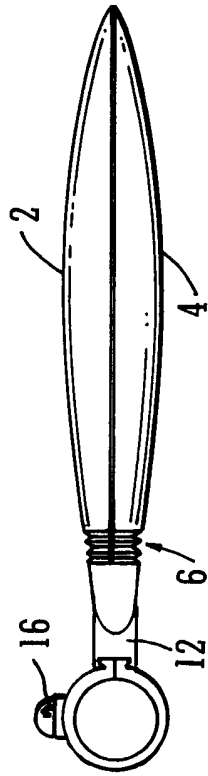
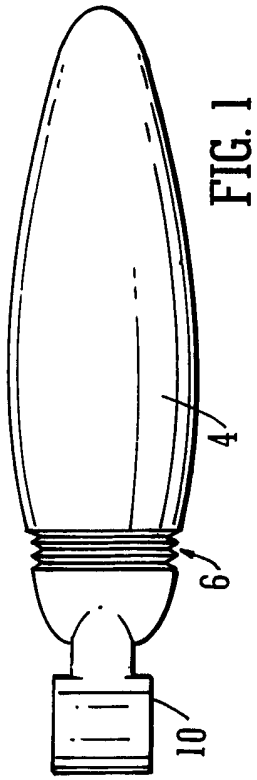
(58) Field of Search:
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(54) Abstract Title: **Folding bicycle indicator**

(57) An indicator for a bicycle comprises a base and first and second substrate portions 2, 4. The substrate portions are connected to the base and foldable between open and closed formations. The substrates are preferably hinged 6. The substrates include LEDs 20 to indicate the direction of travel. Signalling may be achieved by a direction controller mounted on the bicycle handlebar. The LEDs may be coloured white and red to indicate the front and rear of the cycle, and may be illuminated in a sequence along the substrates. The indicator may be mounted using a quick-release bracket 10. The closable nature of the hinged indicator facilitates portability.



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INDICATORField of the invention

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5 The present invention relates to a direction indicating device, and in particular to a device for indicating an intended direction of travel, or intended change of direction of travel, of a vehicle on which the indicator device is mounted. Although the indicator device will be described for use on a cycle, it will be appreciated that the indicator can be used on other vehicles.

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The present invention also relates to a method for mounting the indicating device on a cycle, and to the removal of the device for transport.

Discussion of the prior art

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Conventionally, bicycles are not provided with any direction indicating means. It is therefore usual that when a rider wishes to indicate that they are to change direction, for example when turning a corner, the rider uses their arm to indicate the intended change in direction. This has the disadvantage that
20 the rider is only able to keep one hand on the handlebar, and therefore their control of the bicycle is not as good as when they have both hands on the handlebar. This is potentially dangerous. Also, when a rider is riding a cycle during the dark, the rider's arm may not be visible to other road users when the rider is making hand signals, and therefore other road users may not be
25 aware that the cyclist is intending to change direction.

It is known to provide an indicator device on a cycle. Such devices may include a housing including a power supply, such as a battery, together with one or more light sources. A transparent or translucent part of the housing is
30 provided to allow light from the light source to be transmitted from the housing. By controlling the emission of light from the one or more of the light sources, for example using a switch mounted on the handlebar, the rider can provide a visual indication of an intended change in the direction of travel. The housing is arranged to be fixed to the frame of the cycle.

Since a cycle is relatively thin, and as known indicator devices are mounted on the frame of the cycle, to indicate a particular direction, it is generally necessary for the housing to have a large width so that another road user can determine which direction is indicated. In particular, it is important for the indicator to extend to either side of the frame by a sufficient distance that another road user is able to easily determine whether the light is to the left or right side of the cycle. Alternatively, the direction could be indicated by controlling the illumination such that this progressively moves in the direction of intended travel, for example by providing a series of light sources which are sequentially illuminated such that the illumination moves in the direction of intended travel. In this case also, it is necessary for the indicating device to have a large width so that the movement of the light is discernable by other road users.

As a result of this, and also due to the need to provide a suitable power source and light source, known indicating devices are generally bulky. This is undesirable. Users may find the addition of a bulky apparatus to provide an indication of a change of direction inconvenient, and some users may consider this to affect the performance of their cycle. Further, users may wish to remove the indication means from their cycle when not in use, for example when the user parks their cycle to prevent the theft of the indication means or vandalism and damage of their indicating means. However, this is difficult or inconvenient when the indicator is large and bulky.

Examples of known indicating means for use on a cycle include those available from Eurolight, C-Tronic Designs and the Avenir Flashpoint Indicator Signal Rear Light.

Summary of the invention

According to the present invention, an indication means suitable for use on a cycle comprises a base, a first substrate and a second substrate, the first and second substrates being connected to the base and being moveable between

a first position in which the first and second substrates are arranged substantially parallel to and generally overlying each other, and a second position in which the substrates lie in generally the same plane, extending in opposite directions from the base, the substrates including at least one light emitting device arranged to selectively emit light to indicate a direction of travel when the substrates are in the second position.

When the indicator is in a first position in which the two substrates extend in the same direction, overlying each other, the device is small allowing for enhanced portability and protection of the light emitting element or elements. When the indicator is in the second position, the substrates are extended to a relatively large lateral extend compared to the first position, and therefore provides enhanced visual indication of an intended direction of travel. This means that the indicator is able to provide a good indication of intended direction of travel, whilst being portable when not in use.

The indicator preferably includes a connection element allowing for easy connection and removal from a mounting bracket or the like. The connection element may be provided on the base. The connection element may comprise one of a projection and a recess for engaging a corresponding one of a recess and projection on a mounting bracket. The connection element may also include electrical contact means for electrical connection to a controller that may be provided on a cycle on which the indicator is mounted, for example a direction controlled mounted on the handlebars of the cycle. The connection element may also enable electrical connection to be provided to the indicator. Alternatively, the indicator may include a power supply for activating the light emitting device, for example in the form of a battery or rechargeable battery.

The first and second substrates are preferably connected to the base or to each other by a hinge. In one example, the hinge comprises a length of concertinaed rubber or other material. This is a simple form of hinge that will allow the substrates to reliably move between the first, closed, position and the second, open, position.

The light emitting device is preferably in the form of one or more light emitting diodes. To enhance the light emitted from the device, one or more lenses may be provided to control the emission of the light.

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In a preferred aspect of the invention, a series of light emitting devices are provided on each substrate, and a control device is provided to sequentially illuminate the light emitting devices along the length of the substrate. This gives an enhanced indication of direction.

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It is preferred that where the indication device includes an element for providing an additional light for indicating whether the device is forward facing or rear facing. This element may be the same light emitting device as that used to provide the direction indication, but is preferably an additional light emitting device. The element may be arranged to emit light continuously while the indicator device is in use, and not merely when a change in direction is being indicated. The additional light may be arranged to emit a 'red' light where the indicator device is rear facing, and to emit a white light when the device is forward facing. In this case it is preferred that different indicator devices are provided depending whether the device is to be forward facing or rear facing, with the additional light being coloured appropriately depending on the intended usage of the device. However, a single device could be provided with the user able to selectively determine the colour of the additional light depending on the orientation of the device in use.

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Brief description of the drawings

The present invention will now be described by way of example with reference to the accompanying drawings, in which:

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Figure 1 shows a side view of an example of the indicating means when closed;

Figure 2 shows a top view of the indicating means of Figure 1;

Figure 3 shows a view of the indicating means of Figures 1 and 2, when detached from the mounting bracket; and

- 5 Figure 4 shows a view of the indicating means in an operative condition.

Detailed description of a preferred example

10 The indicator of the present invention includes two substrates in the form of panels or paddles 2, 4 which are connected via a hinge mechanism 6. The paddles 2, 4 each include one or more light emitting portions 20 which are arranged to be able to indicate an intended direction of travel. The hinge mechanism 6 is connected to a base, which includes a connection piece 12 which enables the indicator to be connected to a bracket 10 that can be
15 attached to the frame of a cycle or the like. The connection between the indicator and the bracket 10 may include the necessary electrical connections to selectively activate the light emitting portions 20 of the indicator.

20 The bracket 10 comprises a main body, which is generally cylindrical, but which is incomplete around the circumference to form an opening or slit extending along the entire height of the body portion. This enables the body to be opened up by pulling apart the body portion on either side of the opening to allow the bracket 10 to be passed over the frame of the cycle. A clamping mechanism 16 is provided to pull together the opposite sides of the
25 opening of the body, thereby squeezing the inner walls of the body of the bracket 10 around the frame of the cycle. A suitable clamping mechanism 16 would be a screw that is threaded to the body on either side of the opening, such that the tightening of the screw pulls the sides of the body on each side of the opening closer together.

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As best shown in Figure 3, the bracket 10 also includes a projection 14 that can be received within a complimentary recess 12 in the body portion of the indicator to attach the indicator to the bracket 10. It will be appreciated that other connections between the bracket 10 and the indicator can be utilised.

Where such a connection is provided, this should be able to hold the indicator securely even when the cycle to which the indicator is mounted is being ridden, and it is desired that the indicator can be simply and quickly removed from the bracket 10 when desired.

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Advantageously, the bracket 10 included electrical contacts that are able to make electrical connection between a power source and control device which can be provided on the cycle, and the light emission devices provided on the indicator. For example, the power source may be in the form of a battery pack
 10 mounted on the cycle frame, or could be a dynamo which generates electrical power from the rotation of the wheels. The control device may include a suitable switch that can be operated by a user depending upon the desired light emission of the indicator, and could be a simple switch mounted on the handlebars with a first position to indicate a turn to the left and a second
 15 position to indicate a turn to the right. A separate control or further position on the controller may be used to turn the indicator device on and off, in particular to cause a 'red' light to be illuminated for a rear facing indicator, or a 'white' light for a forward facing indicator. Depending upon the position of the switch, control electronics may be used to generate a suitable driving signal
 20 for driving the light emitting devices on the indicator mechanism. It will be appreciated that some or all of the power and control means may be provided within the indicator itself. Whilst this may increase the size and weight of the indicator, it may be preferable to have at least some of the power and control elements removable with the indicator. For example, the power source may
 25 comprise a small battery which can be provided within the paddles 2, 4. A control circuit for causing the correct illumination of the light emitting elements may be provided in the form of an integrated circuit, and may be provided within the paddles 2, 4 or indicator base.

30 The indicator itself includes a first paddle 2 which, in use, extends to one side of the bracket 10, and a second paddle 4 which, in use, extends to the opposite side of the bracket 10, as best shown in Figure 4. The paddles 2, 4 are formed as injection moulded components, and may be shaped with a curved outer surface to help reduce drag when in use, and to reduce the risk

of injury if the paddles 2, 4 were to hit anyone during use. The paddles 2, 4 are connected by a hinge 6. The hinge 6 may be connected directly between the first and second paddles 2, 4, or hinges 6 may be connected between each paddle 2, 4 and a base of the indicator. In either case, the paddles 2, 4 are moveable between a closed position in which the paddles extend generally parallel to and overlying each other (as shown in Figures 1 to 3), and an open position in which the paddles 2, 4 lie in generally the same plane, extending away from each other (as shown in Figure 4).

In the closed position, as the paddles 2, 4 overlie each other, the indicator takes up the minimum available space. Also, the light emitting elements will face each other, and so will be protected by the other paddle 2, 4, the light emitting elements being within the closed indicator. In this condition, the indicator is particularly suitable for carrying by the user, being small and protected. Also, when the indicator is mounted on the cycle, but when the indicator is not being used (for example when the cycle is being used off-road), the indicator can be closed. This reduces the laterally extending size of the indicator and therefore reduces drag, and also reduces the possibility that the light emitting elements will become dirty, and therefore not visible.

In the open position, the two paddles 2, 4 extend laterally from the central base, and in use extend laterally to either side of the central plane of the cycle on which the indicator is mounted. Due to this relatively large width, when the light emitting elements on either of the paddles 2, 4 are illuminated, it is easy for another road user to determine which side of the cycle the indication is being given, and therefore in which direction the rider is intending to travel.

The hinge 6 is preferably of a type which locks into place when the paddles 2, 4 are in their fully opened and fully closed position to prevent undesired opening or closing of the indicator. A suitable hinge 6 comprises a concertinaed rubberised component that is able to bend along its length, with the concertinaed sections on one side being expanded and the concertinaed sections on the other side being compressed to cause the opening of the paddles.

The light emitting elements 20 of the indicator may be any suitable light emitting elements, and may include one or more light emitting diodes with or without suitable lenses or filters to give the required illumination. In a preferred example, to further assist indication of the desired direction of travel, a number of light emitting elements may be provided along each paddle 2, 4. By sequentially illuminating the lights, the intended direction of travel may be more clearly indicated than using a single light emitting element. For example, in Figure 4, the first paddle 2 includes ten light emitting elements 20₁ to 20₁₀. The first light emitting element 20₁ is provided closest to the hinge 6, with the light emitting elements being progressively positioned towards the distal end of the paddle. To indicate an intended change of direction in the direction towards light emitting element 20₁₀, the first light emitting element 20₁ is initially illuminated, followed by the second light emitting element 20₂, then the third light emitting element 20₃ and so on until the final light emitting element 20₁₀ is illuminated. The sequence can then be restarted. This progressive illumination of the light emitting elements 20₁ to 20₁₀ creates an impression of movement in the direction of intended travel.

The indicator can be used on either the front or rear of a vehicle, and it is particularly preferred that one indicator is provided on the rear of the vehicle to provide an indication for road users following the vehicle, with another indicator provided on the front of the vehicle to provide an indication for an intended change of direction to on-coming road users. The different indications are also useful for pedestrians. In this case, . Additional light emitting elements may be provided to generate a 'white' light for forward facing indicator devices or a 'red' light for rear facing indicator devices.

CLAIMS

1. An indicator suitable for use on a bicycle, the indicator comprising:
a base;
5 a first substrate; and,
a second substrate, in which:
the first and second substrates are connected to the base and
are moveable between a first position in which the first and
second substrates are arranged parallel to and overlying each
10 other, and a second position in which the substrates lie in
generally the same plane, extending in opposite directions from
the base; and,
the substrates including at least one light emitting device
arranged to selectively emit light to indicate a direction of travel.
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2. An indicator according to Claim 1, further comprising a connection
element allowing for easy connection and removal from a mounting bracket or
the like.
- 20 3. An indicator according to Claim 2, in which the connection element
comprises one of a projection and a recess for engaging a corresponding one
of a recess and projection on a mounting bracket.
4. An indicator according to Claim 2 or Claim 3, in which the connection
25 element includes electrical contacts for electrical connection to a controller.
5. An indicator according to Claim 4, in which the controlled comprises a
direction controller mounted on the handlebars of a cycle.
- 30 6. An indicator according to Claim 4 or Claim 5, in which the connection
element includes electrical contacts for supplying power to the light emitting
device of the indicator.

7. An indicator according to any one of Claims 1 to 5, further including a power supply for activating the light emitting device, for example in the form of a battery or rechargeable battery.
- 5 8. An indicator according to any one of the preceding claims, in which the first and second substrates are connected to the base or to each other by a hinge.
9. An indicator according to Claim 8, in which the hinge comprises a
10 length of concertinaed rubber or other material.
10. An indicator according to any one of the preceding claims, in which the light emitting device comprises one or more light emitting diodes.
- 15 11. An indicator according to any one of the preceding claims, including one or more lenses may be provided to control the emission of the light from the light emitting device.
12. An indicator according to any one of the preceding claims, in which a
20 series of light emitting devices are provided on each substrate, and a control device is provided to sequentially illuminate the light emitting devices along the length of the substrate.
13. An indicator according to any one of the preceding claims and arranged
25 to be used on the rear of a cycle, including a light emitting means arranged to emit a 'red' light.
14. An indicator according to any one of the preceding claims and arranged
30 to be used on the front of a cycle, including a light emitting means arranged to emit a 'white' light.
15. The combination of an indicator according to any one of the preceding claims and a bracket for mounting the indicator to the frame of a cycle, the bracket being arranged to be connected to the frame of the cycle, the indicator

including a connection means for coupling to a corresponding connection element on the bracket allowing for easy connection and removal of the indicator from the bracket.

- 5 16. A method of providing an indicator on a cycle, comprising attaching an indicator according to any one of claims 1 to 14 to a cycle, moving the first and second substrates into the second position in which the first and second substrates extend laterally from the central plane of the cycle, and selectively illuminating the light emitting device to indicate a direction of intended travel.

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17. A method of removing an indicator according to any one of claims 1 to 14 from a cycle, the method comprising moving the first and second substrates from the second position to the first position in which the first and second substrates overlie each other, and detaching the indicator from a
15 bracket mounting the indicator on the cycle.

18. An indicator substantially as shown in or as described with reference to any of the accompanying drawings.



-12-



INVESTOR IN PEOPLE

Application No: GB0516872.9**Examiner:** Alan Jones**Claims searched:** 1-18**Date of search:** 10 November 2005**Patents Act 1977: Search Report under Section 17****Documents considered to be relevant:**

Category	Relevant to claims	Identity of document and passage or figure of particular relevance
X	1-3, 7, 8, 10, 11 & 15-17	US2005/0024884 A1 (SEMINARA ET AL) See e.g. figs 8 & 9, paragraph [0034] & LED 30
X	1-5, 7, 8, 11, 16 & 17	US5617303 A (IZZO, SR) See e.g. figs 6-9, mounting bracket or the like 101
X	1, 7, 8, 11 & 16	US3950727 A (SMITH) See e.g. figs 2 & 4
X	1, 7, 8, 10 & 11	DE19926565 A1 (SCHMIDT) See e.g. fig 2, LEDs 33
X	1 & 8	FR1165461 A (CESARACCIO) See e.g. figs 5, 7 & claim 6

Categories:

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.

Field of Search:Search of GB, EP, WO & US patent documents classified in the following areas of the UKC^X :

F4R

Worldwide search of patent documents classified in the following areas of the IPC⁰⁷

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The following online and other databases have been used in the preparation of this search report

Online: WPI, EPODOC