

TITLE: BICYCLE SAFETY DEVICE

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BICYCLE SAFETY DEVICE

FIELD OF THE INVENTION

The device described herein relates to the field of vehicle safety. The invention relates, but not exclusively, in the field of safety warning signal devices for use in bicycles comprising an extendable arm mechanism.

BACKGROUND OF THE INVENTION

According to the Center for Disease Control (CDC), bicyclists face a higher risk of crash-related injury and deaths than occupants of motor vehicles do. In 2010 in the U.S., almost 800 bicyclists were killed and there were an estimated 515,000 emergency department visits due to bicycle-related injuries (Source: <http://www.cdc.gov/HomeandRecreationalSafety/Bicycle/>).

Interventions that have shown promise, according to the CDC, for reducing injuries and fatalities to bicyclists include active lighting and rider visibility devices. Active lighting and rider visibility devices are used to visually highlight the presence of a bicycle rider on the road. The problem that persists today is that most safety devices do not give the bicycle rider enough safety. Although many devices have flashing active lights, they do not sufficiently inform the motor vehicle driver of the preferable space needed between the motor vehicle and the bicycle rider. There is a need for a simple device that provides for flexibility of use, is highly visible and signals to other vehicles on the road of how much minimum preferred space is desired by the rider of the bicycle.

BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 is an overall representation of the safety device on a bicycle.

Figure 2a is an exploded view of the safety device.

Figure 2b is a close up on the extension tube and the incision where the LED lights are placed

Figure 3 is rear view of the safety device on a bicycle showing a first, second and third outwardly extended position.

Figure 4a is a top view of the safety device a non-impact position and in an impacted position.

Figure 4b is a top view of the safety device a first, second and third position from the baseline reference 1-1.

Figure 4c is a partial cross-sectional view of the safety device illustrating the dimple and recess engagement.

Figure 5a is a view of the bracket assembly allowing the safety device to be connected to the bicycle.

Figure 5b is a cross-sectional view of the bracket assembly.

DETAILED DESCRIPTION

Figure 1 is an overall picture of a first embodiment of the bicycle safety device 10 attached to an exemplary bicycle 5. Among other things, Figure 1 illustrates where the safety device 10 could be positioned relative to the bicycle 5. In this embodiment, it is attached to the seatpost. When not in use, the safety device 10, can be conveniently contracted into a closed position and further tucked under the saddle. When in use, the safety device 10 is extended to an open position. In this position, the device 10 is extended outwardly in an approximate perpendicular manner to the forward motion of the bicycle. The extension of the safety device 10 thereby provides a Personal Bicycle Bubble™ that informs motor vehicle drivers of the space that is required between the bicycle and the motor vehicle. The Personal Bicycle Bubble™ is an imaginary envelope of space that provides the necessary space to make the bicycle rider comfortable on the road shared by motor vehicles. The safety device's flexibility in expanding to a length desirable by the bicycle rider helps to facilitate this comfort.

Figure 2a is an exploded view of the safety device 10 which highlights the substantially linear layout of the lights 16. In the first embodiment, there is an incision where linear lights lay within the tube 15. The tube arrangement 15 is expandable in a telescopic manner thereby allowing a range of length available to the rider for an open position of the safety device 10. In this embodiment, there are three telescopic tubes ranging in size from large to medium to small - similar to a telescopic antenna arrangement. Each tube 15 has an incision along the side where LED lights 16 are equally spaced therebetween. The lights will be placed in a slit within the tube. 26 The bracket assembly 26 allows the extension tube to be placed in a location on the bike that allows the rider to have a flexible and comfortable ride where the tube will not interfere.

Figure 2b is a close up on the extension tube 10 that magnifies the details of the incisions on the extension tube where the LED lights lay within. The bumper 14 at the

end is an additional aid for drivers to visualize the space that is required between them and the cyclist.

The light emitted from the safety device 10 allows drivers to see the light that emit from the tube. At the distal end of the telescopic arrangement, a preferably reflective element 14 allows the driver to have a visual cue of where the rider's safety bubble ends and where the driver should keep his/her distance from the rider. The element 14 may be a light emitting, reflective or some combination thereof. If light emitting, the element 14 may also be powered by the same power source of the light source 16.

With this linear-like arrangement of light, the safety device 10 gives a more accurate cue of the true space/distance that is needed between the driver and the rider for drivers to safely over pass the rider. Unlike other prior art arrangements that just light up or flash in mid-air with a void of space between the light and the rider, the safety device 10 creates fills the void between the rider and the distal end of the the safety device 10 with an arrangement of lights.

Figure 3 gives a visual representation of how the telescopic tube arrangement functions in a first, second and third outwardly extended position. Based on the circumstances, the rider has the choice of adjusting the arrangement to different lengths. This flexibility of adjusting the arrangement to the length desired by a rider is advantageous. In some instances, riders may feel that the motor vehicle drivers may be more reckless in a particular area of the city and as a result will call for a greater extension of the arrangement whereas other roadways are simply too narrow to begin with such that a shorter extension arrangement may be warranted.

Figures 4a to 4c demonstrate the collapsible/storage feature of the bracket assembly. This feature prevents safety device 10 from breaking or undesirably applying force to the rider when an impressive force is applied to it (such as being hit by a passing motor

vehicle). As shown in Figure 4b, if an automobile or an object applies sufficient force onto the arm, the arm will simply move from a warning signal position reference line A-A to reference line B-B. If sufficient force is applied, the arm will move to a non-warning signal position reference line C-C. Various mechanisms can achieve this collapsible feature. In this first embodiment, as shown in Figures 4b and 4c, an arc latch base 18 facilitates the collapsible feature. From a top view (Figure 4a), the latch base 18 is in the shape of a quarter of a circle. In this embodiment, for every 30° of the arc there is a small bump or dimple 20 on the top surface which acts as a locking latch for the three levels of positions. Correspondingly, there is a recess 22 on the arm to receive the dimple and secure the arm in place until another predetermined force is applied to once again move the arm to another collapsible position. The bracket means assembly enables the safety device when not in use to be placed in a non-warning signal use position by the rider grasping some portion of the arm and swinging the arm through approximately 90 degree such that the arm ends up in a position under the seat.

Figures 5a and 5b illustrate another embodiment of the bracket assembly 26 that allows attachment of the safety device 10 to the bicycle seatpost. In this embodiment, the safety device 10 has an integrated cantilever-like hinge 24 on the side surface that permits the device 10 to connect to a receiving bracket 26 that further connects to the bicycle seatpost. A similar dimple 20, recess 22 locking configuration in the hinge 24 and bracket 26 allows the device 10 to rotate about reference line D-D and lock into the desired predetermined position.

The foregoing disclosure is offered for public dissemination in return for the grant of a letters patent for an invention. It is hoped this safety device will enhance the safety of bicycle riders of all ages and that there are further enhancements to this device as illustrated herein. Those skilled in the art will appreciate the safety device described herein may be altered in various ways while still keeping within the spirit of the breadth

and scope of the claims below. Such variations are reserved as part of the patentee's statutory rights.

Claims

I claim:

1. A safety device for a bicycle comprising:
 - a housing having a closed end and an open end,
 - an extendable arm contained at least partially in the housing and extending from the open end thereof, the arm positionable in a closed and open position relative to the housing,
 - a bracket assembly to receive the housing and connect the bracket to the bicycle .

2. A safety device for bicycles as claimed in claim 1 wherein the arm includes a lighting means such that the light emitted from the device is presented in a substantially linear fashion when viewed from a distance.

3. A safety device for bicycles as claimed in claim 1 wherein the arm is collapsible from an obtrusive position relative to the bracket assembly to a non-obtrusive position relative to the bracket assembly upon a predetermined amount of force being applied to it.

4. A safety device for bicycles as claimed in claim 1 wherein at a distal end of the arm a visual element is connected thereby further signalling to passersby vehicles the end of the distance required between the rider and the driver's vehicle.

5. A safety device for a bicycle comprising:
 - a telescopic arm, the arm positionable in a range of positions including a closed and open position,
 - a lighting means in the arm such that the light emitted from the device is presented in a substantially linear fashion

a bracket assembly to receive a portion of the arm a first end and connect the bracket to the bicycle on a second end.

6. A safety device for a bicycle as claimed in claim 5 wherein the arm is collapsible into a non-obtrusive position upon a predetermined amount of force being applied to it, the arm includes at the distal end a visual element that notifies drivers of the end of the distance required between the rider and the driver's vehicle.