DEVICE FOR SECURING A BICYCLE

FIELD OF INVENTION

The present invention relates to a device for securing a bicycle and in particular, but not exclusively, to a bicycle parking system using the device for securing a bicycle against theft.

BACKGROUND TO THE INVENTION

The following discussion of the background to the invention is intended to facilitate an understanding of the present invention. However, it should be appreciated that the discussion is not an acknowledgment or admission that any of the material referred to was published, known or part of the common general knowledge in any jurisdiction as at the priority date of the application.

It is known that in many countries, cycling is a means of transport for many people. Increasingly, more public bicycle parking systems are provided in public places like train or railway stations, bus interchanges, schools, supermarkets, parks and residential areas for cyclists to park their bicycles. Conventional public bicycle parking systems typically comprise a frame, which is bolted to the ground, having multiple racks for holding multiple bicycles. Each rack typically has two members which are spaced apart for receiving a portion of the front wheel of a bicycle therebetween. Alternatively, such systems may not comprise a frame. Instead, the racks are mounted directly to a wall.

To park a bicycle using the bicycle parking systems mentioned above, a portion of the front wheel of a bicycle is first placed between the two members of a rack. Subsequently, the bicycle can be attached to the rack by means of a conventional bicycle lock or by a chain or the like provided with locking means such as a padlock, which secures the front wheel to the rack to prevent theft.

However, such bicycle parking systems are not very secure against theft because only the front wheel is secured to the rack while the frame and rear wheel are not secured to the rack. Hence, bicycle thefts still occur in such bicycle parking systems. For example, it is possible for a potential thief to detach the rear wheel of a bicycle parked in such bicycle parking systems as the rear wheel is not being secured to the rack.

DE19623924 discloses a bicycle stand having a locking shackle connected by a pivot to an extendable base frame. The locking shackle is manually or automatically operated by means of a control facility fitted around the frame of the bicycle. It is equipped with a manually operated lock or automatic locking component so that the frame and front and rear wheels are protected against theft. However, the disclosed bicycle stand and in particular the locking shackle has several moving parts which increase the possibility of wear and tear, as well as the maintenance thereof.

DE4317016 discloses a bicycle parking stand for use in public spaces. Unlike the bicycle stand of DE19623924, the bicycle parking stand is a simple structure and consists of one iron bracket of conventional shape, which is anchored to the

ground by two screws. The rear wheel of a bicycle is placed by the stand, and the rear wheel and bicycle frame are secured to it by a conventional heavy-duty bracket lock. Although the rear wheel and the bicycle frame are secured to the stand, the front wheel is not secured to it. Hence, it is still possible for a thief to remove the front wheel of the bicycle.

Therefore, the present invention seeks to provide a device for securing a bicycle that overcomes, or at least alleviates, the above-mentioned problems. In particular, to provide a device which effectively secures the frame, and front and rear wheels of a bicycle, is easy to use and requires minimal or no maintenance.

SUMMARY OF THE INVENTION

In accordance with a first aspect of the invention, there is provided a device for securing a bicycle to a bicycle parking system comprising:

an elongate member having a first protrusion for securing the front wheel of the bicycle to the bicycle parking system, a second protrusion shaped for receiving a bicycle lock for securing the rear wheel of the bicycle to the bicycle parking system, and a third protrusion positioned between the first and second protrusions shaped for receiving a bicycle lock for securing the frame to the bicycle parking system.

Preferably, the first, second and third protrusions extend from the elongate member in the same direction.

Preferably, the first protrusion comprises a stop at its free end for securing the device to the bicycle parking system.

Preferably, the second protrusion forms a loop with a first portion of the elongate member.

Preferably, the third protrusion forms a loop with a second portion of the elongate member.

Preferably, the first protrusion is provided at one end of the elongate member.

Preferably, the second protrusion is provided at the other end of the elongate member.

In accordance with a second aspect of the invention, there is provided a bicycle parking system comprising:

a rack for receiving at least a portion of the front wheel of a bicycle; and

a device according to the first aspect of the present invention, the device being coupled to the rack for securing the bicycle to the bicycle parking system.

In accordance with a third aspect of the invention, there is provided a bicycle parking system comprising:

a frame;

a lower rack for receiving at least a portion of the front wheel of a first bicycle;

an upper rack for receiving a second bicycle, the upper rack being slidably engaged to the frame and the frame for supporting the upper rack;

a first device according to the first aspect of the present invention being coupled to the lower rack for securing the first bicycle to the parking system; and

a second device according to the first aspect of the present invention being coupled to the upper rack for securing the second bicycle to the parking system,

wherein the upper rack and the frame are being configured such that the upper rack is movable between a first position, where the upper rack is at an incline to the lower rack, and a second position, where the upper rack is above and substantially parallel to the lower rack.

In accordance with a fourth aspect of the invention, there is provided a method for installing a device according to the first aspect of the present invention to a bicycle parking system, comprising:

coupling the device to a portion of a rack of the bicycle parking system via coupling means such that the device is secured to the bicycle parking system.

BRIEF DESCRIPTION OF DRAWINGS

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

FIG. 1 is a perspective view of a device for securing a bicycle to a bicycle parking system in accordance with a first aspect of an embodiment of the present invention;

FIG. 2 is a perspective view of a bicycle parking system comprising the device of FIG.1 in accordance with a second aspect of an embodiment of the present invention;

FIG. 3 is a perspective view of a bicycle parking system comprising the device of FIG. 1 in accordance with a third aspect of an embodiment of the present invention;

FIG. 4 is a perspective view of the bicycle parking system of FIG. 3 when the lower rack is in use;

FIG. 5 is a perspective view of the bicycle parking system of FIG. 3 when a bicycle is secured to the lower rack;

FIG. 6 is a perspective view of the bicycle parking system of FIG. 3 when the upper rack is in the first position;

FIG. 7 is a perspective view of the bicycle parking system of FIG. 3 when the upper rack is in use;

FIG. 8 is a perspective view of the bicycle parking system of FIG. 3 when a bicycle is secured to the upper rack; and

FIG. 9 is a perspective view of the bicycle parking system of FIG. 3 when the upper rack is in the second position and both the lower and upper racks are in use.

DETAILED DESCRIPTION

FIG. 1 shows an embodiment of a device 10 for securing a bicycle to a bicycle parking system (not shown) in accordance with a first aspect of the invention. The device 10 comprises an elongate member, typically in the form of a bar 12. The bar 12 comprises a first protrusion 14, a second protrusion 16 and a third protrusion 18 positioned between the first protrusion 14 and the second protrusion 16.

The first protrusion 14 is provided at one end of the bar 12. The first protrusion 14 extends from the bar 12 and is for securing the front wheel of the bicycle to the bicycle parking system. The first protrusion 14 secures the front wheel to the bicycle parking system by passing through the front wheel. The first protrusion 14 also limits the movement of the device 10, thereby preventing removal of the front wheel from the bicycle parking system. The first protrusion 14 comprises a stop 20 at its free end 22 for securing the device 10 to the bicycle parking system. The stop 20 as shown in FIG. 1 is substantially round and has a diameter that is greater that the diameter or width of the first protrusion 14. It would be appreciated that the stop 20 can be of a different shape such as a square, a rectangle, a triangle or a polygon.

The second protrusion 16 is provided at the other end of the bar 12. The second protrusion 16 extends from the bar 12 and forms a loop with a first portion 24 of the bar 12. The second protrusion 16 is shaped for receiving a bicycle lock (not shown) for securing the rear wheel of the bicycle to the device 10 and hence the

bicycle parking system. The shape of the second protrusion 16, which is in the form of the loop, enables the bicycle lock to pass therethrough.

As described above, the third protrusion 18 is positioned between the first protrusion 14 and the second protrusion 16. The third protrusion 18 extends from the bar 12 and forms a loop with a second portion 26 of the bar 12. The third protrusion 18 is shaped for receiving the bicycle lock for securing the frame to the device 10 and hence the bicycle parking system. The shape of the third protrusion 18, which is in the form of the loop, enables the bicycle lock to pass therethrough.

Advantageously, the first, second and third protrusions 14, 16, 18 secure the front wheel, the rear wheel and the frame of the bicycle, respectively, to the bicycle parking system. In this way, the whole bicycle or the front and/or rear wheels would be protected against theft. Hence, the device 10 is able to effectively secure the bicycle to the bicycle parking system. The device 10 can also be used with a variety of bicycles sizes.

Advantageously, the first, second and third protrusions 14, 16, 18 extend from the bar 12 in the same direction as shown in FIG. 1 for easy handling of the device 10 when the device 10 is coupled to the bicycle parking system and is in use.

Furthermore, as the device 10 does not have any moving parts, the device 10 is easy to manufacture and the possibility of wear and tear and the need for maintenance are also minimised.

FIG. 2 shows an embodiment of the device 10 for securing a bicycle (not shown) to a bicycle parking system 200 in accordance with a second aspect of the invention. The bicycle parking system 200 comprises a rack 202 which is anchored to the ground. The rack 202 is for receiving at least a portion of the front wheel of the bicycle.

The rack 202 comprises coupling means, such as a first bar 204 and a second bar 206 which are fixed to a portion of the rack 202, for coupling the device 10 to the rack 202. The first bar 204 is substantially parallel to the second bar 206 and are fixed to the rack 202 such that an opening 208 is defined between the first bar 204 and the second bar 206. The opening 208 is for receiving the first protrusion 14 of the device 10. The width of the opening 208 should not be wider than the diameter or the width of the stop 20. In this way, the first protrusion 14 is free to move along the length and width of the opening 208 without the device 10 being removed from the rack 202 during movement thereof. This is because the stop 20, having a diameter or width that is greater than the width of the opening 208, would engage the first and second bars 204, 206 instead of passing through the opening 208 when an attempt is made to remove the device 10 from the rack 202. Advantageously, the device 10 is secured to the rack 202. The device 10 being coupled to the rack 202 is for securing the bicycle to the rack 202 and hence to the bicycle parking system 200.

FIG. 3 shows an embodiment of the device 10 for securing a bicycle (not shown) to a bicycle parking system 300 in accordance with a third aspect of the invention. The bicycle parking system 300 comprises a frame 302 having a base 304, a

lower rack 306 and an upper rack 308. The base 304 is anchored to the ground which in turn anchors the entire bicycle parking system 300 to the ground. The lower rack 306 is fixed to the base 304 and is for receiving at least a portion of the front wheel of the bicycle to be secured to the lower rack 306.

The frame 302 further comprises a vertical support 310 and a platform 312. The vertical support 310 is attached to the base 304 at one end and is attached to the platform 312 at its other end. The vertical support 310 is for supporting the platform 312. As shown in FIG. 3, the vertical support 310 and the platform 312 together form an inverted L shape structure. The vertical support 310 comprises reinforcing means such as in the form of a plank 314, for providing extra support to support the platform 312. One end of the plank 314 is fixed to the vertical support 310 and the other end is fixed to the platform 312. As a result, the platform 312 has two points of support, namely the support provided by the vertical support 310 and the extra support provided by the plank 314.

The platform 312 is for supporting the upper rack 308 and the upper rack 308 is slidably engaged to the platform 312. The upper rack 308 is for receiving a second bicycle to be secured to the upper rack 308. The upper rack 308 and the platform 312 are configured such that the upper rack 308 is movable between a first position, where the upper rack 308 is at an incline to the lower rack 306, and a second position where the upper rack 308 is above and substantially parallel to the lower rack 306. The upper rack 308 comprises a wheel 316 at the base of one end of the upper rack 308 which comes into contact with the ground when the upper rack 308 is moved to the first position. The wheel 316 is for supporting the

upper rack 308 when the upper rack 308 is in the first position, and also for preventing damage of this end of the upper rack 308.

The lower rack 306 comprises coupling means just like the first bar 204 and the second bar 206 as described in the bicycle parking system 200 above, for coupling the device 10 to the lower rack 306. The upper rack 308 comprises a similar coupling means for coupling a second device 10' to the upper rack 308. Similar to the device 10, the second device 10' also comprises a bar 12' having a first protrusion 14', a second protrusion 16' and a third protrusion 18' positioned between the first protrusion 14' and the second protrusion 16'. The first protrusion 14' also comprises a stop 20' at its free end 22'. Advantageously, the device 10 and the second device 10' are secured to the lower rack 306 and upper rack 308, respectively.

The device 10 being coupled to the lower rack 306 is for securing the first bicycle to the lower rack 306 and hence to the bicycle parking system 300. Similarly, the second device 10' being coupled to the upper rack 308 is for securing the second bicycle to the upper rack 308 and hence to the bicycle parking system 300.

Advantageously, the lower and upper racks 306, 308 enable the bicycle parking system 300 to be a double tier system, which allows for two bicycles to be parked and secured at any one time. This provides the advantage of overcoming space constraints.

FIG. 4 shows the lower rack 306 of the bicycle parking system 300 when in use. Before a portion of the front wheel of a bicycle 400 can be received in the lower rack 306, the device 10 is moved in a direction as shown in FIG. 4 by an arrow labelled A. The device 10 is moved in this direction till the stop 20 of the first protrusion 14 engages the coupling means. This ensures that the path for entry of the front wheel of the bicycle 400 is not obstructed and allows the front wheel of the bicycle 400 to be pushed into the lower rack 306, which otherwise would not have been possible due to the obstruction of the path for entry by the first protrusion 14. After the device 10 is being moved and the path for entry is clear, the bicycle 400 is pushed into the lower rack 306 till the bicycle 400 comes to a stop and is parked.

Thereafter, the device 10 is moved in a direction opposite to the direction labelled by the arrow A in FIG. 4, toward the parked bicycle 400 such that the first protrusion 14 goes through the front wheel of the bicycle 400, the second protrusion 16 goes through the rear wheel of the bicycle 400 and the third protrusion 18 is positioned between the front wheel and the frame of the bicycle 400, as shown in FIG. 5. Next, a conventional bicycle lock 318 is passed through the second protrusion 16, the third protrusion 18, the rear wheel and the frame of the bicycle 400 thereby forming a loop. As such, the bicycle 400 is secured to the lower rack 306 and the bicycle parking system 300 by securing the bicycle 400 to the device 10. Advantageously, the device 10 effectively secures the front wheel, the frame and the rear wheel of the bicycle 400 to the bicycle parking system 300.

Apart from the use of the conventional bicycle lock 318, it would be appreciated that other kinds of locks such as a chain or the like provided with locking means such as a padlock can also be used to secure the frame and the rear wheel of the bicycle 400 to the device 10.

When the upper rack 308 of the bicycle parking system 300 is not in use, the upper rack 308 is in the second position where the upper rack 308 is above and substantially parallel to the lower rack 306 as shown in FIGS. 3, 4 and 5. In order to use the upper rack 308 for securing a bicycle, the upper rack 308 is first moved to the first position as shown in FIG. 6. As described above, the first position is where the upper rack 308 is at an incline to the lower rack 306 and where the wheel 316 comes into contact with the ground. To move the upper rack 308 from the second position to the first position, the upper rack 308 is slid along the platform 312 in a direction away from the platform 312 till the upper rack 308 can no longer move in this direction. Next, the upper rack 308 is moved in a direction toward the ground till the wheel 316 is in contact with the ground thereby arriving at the first position where the upper rack 308 is at an incline to the lower rack 306.

Thereafter, similar to the lower rack 306, before a bicycle can be received in the upper rack 308, the second device 10' is moved in a direction as shown in FIG. 6 by an arrow labelled A'. The second device 10' is moved in this direction till the stop 20' of the first protrusion 14' engages the coupling means. This ensures that the path for entry of the bicycle is not obstructed and allows the bicycle to be pushed into the upper rack 308, which otherwise would not have been possible due to the obstruction of the path for entry by the first protrusion 14'.

After the device 10' is being moved and the path for entry is clear, a bicycle can then be pushed into the upper rack 308. FIG. 7 shows a second bicycle 700 being pushed into the upper rack 308. The front wheel of the bicycle 700 is first lifted off the ground and placed into a portion of the upper rack 308.

Next, the bicycle 700 is pushed up the inclined upper rack 308 till the rear wheel of the bicycle 700 is also received in the upper rack 308 as shown in FIG. 8. As such, the whole bicycle 700 is received and parked in the upper rack 308.

Thereafter, the device 10' is moved in a direction opposite to the direction labelled by the arrow A' in FIG. 6, toward the bicycle 700 such that the first protrusion 14' goes through the front wheel of the bicycle 700, the second protrusion 16' goes through the rear wheel of the bicycle 700 and the third protrusion 18' is positioned between the front wheel and the frame of the bicycle 700, as shown in FIG. 8. Next, a conventional bicycle lock 320 is passed through the second protrusion 16', the third protrusion 18', the rear wheel and the frame of the bicycle 700 thereby forming a loop. As such, the bicycle 700 is secured to the upper rack 308 and the bicycle parking system 300 by securing the bicycle 700 to the device 10'. Advantageously, the device 10' effectively secures the front wheel, the frame and the rear wheel of the bicycle 700 to the bicycle parking system 300.

Apart from the use of the conventional bicycle lock 320, it would be appreciated that other kinds of locks such as a chain or the like provided with locking means

such as a padlock can also be used to secure the frame and the rear wheel of the bicycle 700 to the device 10'.

After the bicycle lock 320 is in place and the bicycle 700 is secured to the upper rack 308, the upper rack 308 with the bicycle 700 therein is moved from the first position back to the second position where the upper rack 308 is above and substantially parallel to the lower rack 306 as shown in FIG. 9. To move the upper rack 308 from the first position to the second position, the upper rack 308 is moved in a direction away from the ground till the upper rack 308 is horizontally aligned with the platform 312. Next, the upper rack 308 is slid along the platform 312 in a direction toward the vertical support 310 till the upper rack 308 can no longer move in this direction to arrive at the second position.

Advantageously, the bicycle parking system 300 overcomes space constraints by enabling two bicycles to be parked and secured at any one time as opposed to only one bicycle.

The device 10 can also be retrofitted to existing bicycle parking systems such as conventional bicycle parking systems which typically comprise a rack for receiving a portion of the front wheel of a bicycle. In such conventional bicycle parking systems, the bicycle is secured to the rack by means of a bicycle lock passing through the front wheel of the bicycle and the rack thereby forming a loop.

The device 10 is retrofitted to such systems by attaching two bars, such as the first bar 204 and the second bar 206 which defines the opening 208 therebetween for

receiving the first protrusion 14 of the device 10, to a portion of the rack. In this way, the device 10 is thus secured to such conventional bicycle parking systems. A secured connection between the two bars and the rack is formed by means such as welding or gluing the bars onto the rack.

Alternatively, the device 10 can be attached to the rack by means of a locking mechanism (not shown) that would allow the device 10 to be locked to and removed from any such conventional bicycle parking systems. Advantageously, the device 10 is transportable from one conventional bicycle parking system to another conventional bicycle parking system.

Although the foregoing invention has been described in some detail by way of illustration and example, and with regard to one or more embodiments, for the purposes of clarity of understanding, it is readily apparent to those of ordinary skill in the art in light of the teachings of this invention that certain changes, variations and modifications may be made thereto without departing from the spirit or scope of the invention as described in the appended claims.

CLAIMS

1. A device for securing a bicycle to a bicycle parking system comprising:

an elongate member having a first protrusion for securing the front wheel of the bicycle to the bicycle parking system, a second protrusion shaped for receiving a bicycle lock for securing the rear wheel of the bicycle to the bicycle parking system, and a third protrusion positioned between the first and second protrusions shaped for receiving a bicycle lock for securing the frame to the bicycle parking system.

2. A device according to claim 1, wherein the first, second and third protrusions extend from the elongate member in the same direction.

3. A device according to any preceding claim, wherein the first protrusion comprises a stop at its free end for securing the device to the bicycle parking system.

4. A device according to any preceding claim, wherein the second protrusion forms a loop with a first portion of the elongate member.

5. A device according to any preceding claim, wherein the third protrusion forms a loop with a second portion of the elongate member.

6. A device according to any preceding claim, wherein the first protrusion is provided at one end of the elongate member.

7. A device according to claim 6, wherein the second protrusion is provided at the other end of the elongate member.

8. A bicycle parking system comprising:

a rack for receiving at least a portion of the front wheel of a bicycle; and

a device according to any preceding claim, the device being coupled to the rack for securing the bicycle to the bicycle parking system.

9. A bicycle parking system comprising:

a frame;

a lower rack for receiving at least a portion of the front wheel of a first bicycle;

an upper rack for receiving a second bicycle, the upper rack being slidably engaged to the frame and the frame for supporting the upper rack;

a first device according to any of claims 1 to 7 being coupled to the lower rack for securing the first bicycle to the parking system; and

a second device according to any of claims 1 to 7 being coupled to the upper rack for securing the second bicycle to the parking system,

wherein the upper rack and the frame are being configured such that the upper rack is movable between a first position, where the upper rack is at an incline to the lower rack, and a second position, where the upper rack is above and substantially parallel to the lower rack.

10. A method for installing a device according to claim 1 to a bicycle parking system, comprising:

coupling the device to a portion of a rack of the bicycle parking system via coupling means such that the device is secured to the bicycle parking system.