(51) International Patent Classification:
B62K 21/18 (2006.01)

(21) International Application Number:
PCT/IB2007/001643

(22) International Filing Date: 20 June 2007 (20.06.2007)

(25) Filing Language: Italian

(26) Publication Language: English

(30) Priority Data:
MO2006A000199 20 June 2006 (20.06.2006) IT

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(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UB, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, LV, MC, MT, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published: — without international search report and to be republished upon receipt of that report

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: DEVICE FOR TURNING A BICYCLE STEERING HANDLEBAR TO A PARKING POSITION

(57) Abstract: The device (100, 200), interposed between the handlebar (3) and the steering tube (2) of a bicycle (1) includes: a first element (10) made integral with the steering tube (2); a second element (20), made integral with the handlebar (3); joint means (40, 240) interposed between the first and second elements (10, 20) for allowing a relative movement between the first and second elements to define an in-use position (M), in which the handlebar (3) is oriented perpendicular to the front wheel (4) of the bicycle (1), and a parking position (P), in which the same handlebar (3) is oriented substantially parallel to the front wheel (4); locking means (60, 260) associated to the joint means (40, 240) for stabilising the in-use position (M) and parking position (P) of the handlebar (3).
A DEVICE FOR TURNING A BICYCLE STEERING HANDLEBAR TO A PARKING POSITION

TECHNICAL FIELD OF THE INVENTION

The invention relates to the technical field of bicycle accessories.

In particular, the invention concerns a device, which allows to reduce the maximum transversal dimension of a bicycle, when it is parked, garaged, loaded on a vehicle, etc.

DESCRIPTION OF THE PRIOR ART

As it is known, the new bicycles, delivered from the factory, e.g. in relative carton boxes, are prepared to occupy as little space as possible, first of all in transversal direction. In order to obtain this effect, two measures are usually applied, normally combined together:

1) the handlebar is arranged parallel to the front wheel and the frame;
2) the pedals are mounted reversed in the respective cranks, so that they are turned inside, and not outside.

Once the bicycle is in use, with the pedals in their places and the handlebar orthogonal to the front wheel, its dimension assumes known values, the maximum of which, in transversal direction, is given by the handle.

Therefore, the handle dimensions become the main obstacle, when the bicycle is to be parked, e.g. leaning against the wall, in a bicycle rack, in an entrance hall, in a garage or the like.

In all these situations it is obviously inconceivable to reduce the dimensions during the stop interval by loosening the screw, which tightens the handlebar tube to the steering tube, folding the handlebar to bring it parallel to the front wheel and to repeat the operation the opposite way to set everything back before leaving again.

The same problem occurs when the bicycle must be loaded on a vehicle, either inside or outside; in many cases it can be indispensable to fold the handlebar, after having loosened the related tightening screws, despite the inconvenience of the operation and the subsequent setting back.
SUMMARY OF THE INVENTION

Therefore, the object of the present invention is to propose a device for turning the handlebar to a parking position, to be introduced between the steering tube and the handlebar, which allows to turn the latter rapidly and easily, from the in-use position, perpendicular to the front wheel, to a parking position, parallel to the front wheel, thus reducing the maximum dimensions of the parked bicycle.

Another object of the invention is to propose a device, in which the in-use position is stabilised securely, so as to prevent dangerous unintentional rotation when the bicycle is moving.

A further object of the invention is to propose a device, which is easy to install, either on newly produced bicycles or the ones already on the market.

A still further object of the invention is to propose a device having a lock, aimed at blocking the parking position, so that the device acts also as anti-theft device.

The above mentioned objects are achieved by a device for turning the steering handlebar of a bicycle to a parking position, characterised in that it includes: a first element made integral with the steering tube of the bicycle; a second element, made integral with the above mentioned handlebar via a connection means; joint means interposed between the first and second elements for allowing a relative movement between said first and second elements to define at least two positions, namely an in-use position with said handlebar oriented perpendicular to the front wheel of the bicycle, and a parking position with the same handlebar oriented substantially parallel to the front wheel; locking means associated to said joint means for stabilising said in-use position and parking position of said handlebar.

BRIEF DESCRIPTION OF THE DRAWINGS

The characteristic features of the invention will be pointed out in the following description of possible embodiments of the proposed device, in accordance with the contents of claims and with help of the enclosed Figures, in which:

- Figure 1 is a lateral view of a first embodiment of the device and a portion of the steering tube of a bicycle, to which it is associated;
- Figure 2 is a vertical section of the device, taken along the plane of line H-II of Figure 1;
- Figure 3 shows a detail of the device, in the same view as Figure 2, in a
different working position;
- Figure 4 shows the same detail of Figure 3, according to an embodiment;
- Figure 5 is a prospective, partial view of a bicycle, whose handlebar, having
  the device of Figure 1, is turned to a parking position;
- Figure 6 is a lateral view of the device of Figure 1, with key operated means
  associated thereto;
- Figure 7 is a section view of the device, taken along the plane of line VII-VII
  of Figure 6;
- Figure 8 is a lateral, section view of a second embodiment of the device;
- Figure 9 is a section view of the device, taken along the plane of line IX-IX of
  Figure 8.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Having regard to Figures from 1 to 7, the reference numeral 100 indicates the
proposed device altogether, according to a first embodiment.

The device 100 includes a first element 10, formed by a basket-like member 11, with
a bushing 12 integral with its upper part.

The basket-like member 11 has, at its bottom, a coaxial stem 110, aimed at entering
the steering tube 2 of a bicycle 1, to which it is removably fastened by known means,
including a screw means 5, introduced in an axial hole 111 of the basket-like member
11 and aimed at engaging a frusto-conical block 6, situated at the lower end of the
 coaxial stem 110 to thrust it, due to the screw means 5 rotation, so as to enlarge it
and push it against the inner wall of the steering tube 2 (Figure 2).

The basket-like member 11 has inside a cylindrical recess 113, coupling with a shank
120, made at the bottom of the bushing 12, whose upper part, protruding above the
basket-like member 11, includes a frusto-conical hub 121, whose smaller diameter is
turned upward.

The basket-like member 11 has four through holes 112, made on its side and
arranged radially spaced to one another by 90 degrees, aligned at a same height and
set to match with an equal number of threaded holes 122, made in the shank 120.

The bushing 12 is fastened to the basket-like member 11 by Allen screws 13, which
pass through the holes 112 and engage with the corresponding threaded holes 122;
the heads 13A of the screws 13 meet outside the basket-like member 11, adhering thereto.

The bushing 12 has advantageously an axial bore 123, whose diameter allows to introduce the screw 5 and to operate it with a suitable tool; in this way it is possible to assemble and disassemble the element 10 from the steering tube 2 without separating the bushing 12 from the basket-like member 11.

A second element 20 is put onto the basket-like member 11 and bushing 12 and has, integral therewith, a known connection means 30 (so-called head lug), aimed at supporting the handlebar 3 of the bicycle 1 (Figures 1, 5).

The second element 20 is formed by a barrel, which contains:

- a lower cylindrical portion 21, whose diameter allows it to couple freely with outside of the basket-like member 11;
- a frusto-conical central portion 22, aimed at coupling with the frusto-conical hub 121;
- an upper cylindrical portion 23, aimed at defining a front abutment 24, in the joining area with the frusto-conical central portion 22.

Finally, the first element 10 includes a plate 50, fastened removably to the top of the bushing 12 by a threaded shaft 51, aimed at engaging with a corresponding threading made in the axial bore 123.

The plate 50 diameter is almost equal to the maximum diameter of the barrel 20, and the plate defines a lower shoulder 52, aimed at preventing the latter from going out, as well as at functions explained later on.

Joint means 40 are interposed between the first and second elements 10, 20 for allowing a relative rotation between the first and second elements 10, 20 to define at least two predetermined positions, namely an in-use position M, in which the handlebar 3 is oriented perpendicular to the front wheel 4 of the bicycle 1, and a parking position P, in which the same handlebar 3 oriented substantially parallel to the front wheel 4.

The joint means 40 are defined by four overturned "V"-shaped notches 41, made along the lower end 25 of the barrel 20, and situated offset to one another by 90 degrees, for snap coupling with corresponding heads 13A of the screws 13, by action of elastic means 42 pushing downwards on the barrel 20.

The elastic means 42 include a helical spring, placed on the upper cylindrical portion
23, resting on the front abutment 24 and with the shoulder 52 resting thereon.

The barrel 20, in its lowermost position (Figures 1 and 2), has its frusto-conical central portion 22 in abutment against the frusto-conical hub 121 and, at the same time, the notches 41 are in abutment against the heads 13a of the screws 13, so that the barrel 20 cannot rotate with respect to the bushing 12 and the basket-like member 11.

By rotating the handlebar 3 and keeping motionless the steering of the front wheel 4, e.g. with one foot or using an outer support, the barrel 20 is forced to raise with respect to the basket - bushing assembly, due to the disengaging of the heads 13a from the notches 41, contrasted elastically by the spring 42, thus obtaining the detachment of the frusto-conical central portion 22 from the frusto-conical hub 121.

When the handlebar 3 reaches the 90 degrees rotation, the barrel 20 snaps automatically in the lowered position, with the notches 41 in abutment against the heads 13a of the screws 13, and the frusto-conical central portion 22 in abutment against the frusto-conical hub 121.

The described simple procedure allows to pass rapidly from the in-use position M to the parking position P and vice-versa; with the above described embodiment, it is possible to turn the handlebar 3 to the parking position, indifferently to the left (Figure 5), or to the right, as it is more convenient.

The conical coupling between the barrel 20 and the hub 121, pressed by the action of the spring 42 and, during the bicycle 1 use, by the rider's weight transferred to the handlebar 3, allows to zero possible radial clearance, so as to make absolutely rigid the connection between the same handlebar 3 and the wheel 4, just like in a bicycle without the device 100.

Locking means 60, assuring absolute safety of the device 100, mainly in the in-use position M, are aimed at preventing the barrel 20 from raising from the position, in which the heads 13a of the screws 13 are housed in the notches 41.

According to a first embodiment of the locking means 60 (Figures 2 and 3), the plate 50 has a threaded shank 51, composed of two parts 51A, 51B, respectively a first part and a second part, mutually coupled in telescopic relation and joined by means of two threaded dowels with elastically loaded balls 61, radially fixed to the first part 51A and aimed at engaging respective helical tracks 62 made in the second part 51B and featuring respective ends with seats 63 for stabilising the elastically loaded balls 61.

One plate 50 rotation, in one direction or the other, defines its open position H (Figure 2), in which the shoulder 52 is moved away from top of the barrel 20, and a closed
position K (Figure 3), in which the same shoulder 52 is in abutment against the barrel 20; in the last situation the barrel 20 is prevented from raising and thus the handlebar 3 is prevented from rotating with respect to the front wheel 4.

An analogous result is obtained by a second embodiment of the locking means 60 (Figure 4), in which the two positions H and K are obtained by a simple unscrewing and screwing of the threaded shaft 51 with respect to the suitably extended threading made in the bore 123.

The second embodiment is slower to operate, but its construction is much cheaper; therefore, the choice between the two solutions depends only on commercial aspects.

The just described device 100 can advantageously feature key operated means 150, aimed at preventing the rotation of the same device 100 from the parking position P to the in-use position M, so as to act also as anti-theft device, when the bicycle 1 is left unattended.

Figures 6 and 7 show a possible, but not only embodiment of the key operated means 150, which includes a sector 151 made integral to the basket-like member 11, below the through holes 112, and having three indents 152, arranged at 90 degrees one from another, with the central one aligned with the in-use position M of the handlebar 3, and with the two lateral ones aligned with the parking position P, defined by the handlebar 3 rightward or leftward rotation.

A rotary hook 153, aimed at engaging with the indents 152, is connected to a key lock 154, made in the connection means 30.

The above described key operated means 150 are aimed at locking the parking position P, as well as the in-use position M; in the last position, the locking has the same safety purpose as the one described in relation to the closed position K of the plate 50, therefore the presence of the key operated means 150 makes unnecessary the previously described locking means 60.

Therefore, in this case it is possible to use a simplified plate 50, not shown, with only open position H defined.

Figures 8 and 9 show a second embodiment of the device 200, mechanically less refined than the first one, but cheaper with respect thereto.

According to this embodiment, the first element 10 includes a basket-like member 211, having in its lower part a coaxial stem 210, aimed at entering the steering tube 2, to which it is fastened by the same means, described in relation to the device first embodiment.
The basket-like member 211 forms at its bottom a collar 212, designed to form a lower abutment for the second element 20, including in turn a cylinder 220, aimed at being set on the same basket-like member 211, by the interposition of the joint means 240, which allows the relative rotation between the two.

The cylinder 220, having integral therewith the connection means 30, aimed at coupling with the handlebar 3, is held removably fastened to the basket-like member 211 by a plug 250 placed on its top.

The joint means 240 are formed by a ferrule 241, interposed between the basket 211 and cylinder 220, and sliding rings 242, placed under the cylinder 220, between the cylinder and the collar 212, and above the cylinder 220, between the cylinder and said plug 250; the ferrule 241 and sliding rings 242 are suitably dimensioned, to allow a rotation without either axial or radial backlash.

Locking means 260, situated between the cylinder 220 and the basket 211, are aimed at defining and stabilising the in-use position M and parking position P of the handlebar 3, and include at least two flared holes 261 made in the outer side surface of the cylinder 220, offset with respect to one another by 90 degrees and aligned at the same height. The flared holes 261 are designed to be engaged alternatively by a pin 262, associated to the basket 211; in the shown example there are three holes 261, with the central one aligned with the means 30.

The pin 262 is threaded and engaged with a threaded hole 214, made in a wing 213, protruding from the collar 212; the same pin 262 is provided with a knob 263, which allows the pin comfortable handling to rotate it in either direction, respectively to engage and disengage it with/from the corresponding flared hole 261, so as to stabilise the position of the cylinder 220 with respect to the one of the basket 211.

The in-use position M of the handlebar 3 is stabilised with the threaded pin 262 engaged with the central flared hole 261, as in the enclosed Figures.

The threaded pin 262 is unscrewed by acting on the knob 263 to disengage the pin from the central flared hole 261 and to allow the cylinder 220 and the associated handlebar 3 to rotate in either direction, to bring the handlebar 3 to one of the parking positions P, which are stabilised by the engaging of the same pin 262 with the corresponding lateral flared hole 261.

Naturally, the described embodiments are only some examples of the possibilities to reach the same object, that is to allow a rapid handlebar rotation from the in-use position to the parking one and vice-versa, with obvious advantages for the reduction
of the maximum dimensions of the parked bicycle.

The proposed device, either according to the first or to the second embodiment, can be easily installed on newly produced bicycles as well as on the ones already on the market.

It is to be pointed out that the handlebar rotation is not obstructed by brakes and/or derailleur control cables, since their standard length is usually sufficient to avoid such obstacles; however, in particular cases, it can be necessary to lengthen one or more of these cables, by a simple and cheap intervention.

The described embodiments have been treated with great care, so as to obtain a device, which is safe during the bicycle normal use and, at the same time, does not present bothersome clearance between the handlebar and the steer.

Another advantage is obtained when the device has a lock, aimed at blocking the parking position, so as to make the bicycle use impossible, or at least very difficult: the obtained anti-theft function cannot substitute the chains used for fastening the bicycle to a motionless body, but it can substitute normal padlocks for blocking wheels, especially during the short stops.

In any case, the proposed device can be obtained with limited costs, certainly proportionate to the offered advantages and suitable for the kind of the customers and the product, for which it is destined. A bigger sales potential can be obtained by commercialisation of more variants, differing in characteristics, construction refinement and price.

It is understood that what above is a mere, not limiting example, therefore, it is obvious that any changes or variants applied to the device embodiment remain within the protective scope defined by the following claims.
CLAIMS

1. A device for turning the steering handlebar of a bicycle to a parking position, characterised in that it includes: a first element (10) made integral with the steering tube (2) of the bicycle (1); a second element (20), made integral with the above mentioned handlebar (3) via a connection means (30); joint means (40, 240) interposed between the first and second elements (10, 20) for allowing a relative movement between said first and second elements to define at least two positions, namely a in-use position (M) with said handlebar (3) oriented perpendicular to the front wheel (4) of the bicycle (1), and a parking position (P) with the same handlebar (3) oriented substantially parallel to the front wheel (4); locking means (60, 260) associated to said joint means (40, 240) for stabilising said in-use position (M) and parking position (P) of said handlebar (3).

2. A device as claimed in claim 1, characterised in that said first element (10) has a coaxial stem (110, 210) at bottom to be introduced into said steering tube (2) and fastened by screw means (5, 6).

3. A device as claimed in claim 1 or 2, characterised in that said first element (10) is formed by a basket like member (11) and a bushing (12) fastened to the basket like member (11) by four Allen screws (13) set radially offset to one another by 90 degrees, with an upper part of said bushing protruding upwards from said basket like member (11) to form a frusto-conical hub (121) having smaller diameter facing upwards and designed to couple with a complementary frusto-conical central portion (22) formed in said second element (20), said second element (20) being in turn formed by a barrel adapted to be set on the above mentioned basket like member (11) and bushing (12), with the bushing having at top a removable plate (50) with a shoulder (52) designed to enclose an upper part of said barrel (20).

4. A device as claimed in claim 3, characterised in that said basket like member (11) has at bottom a cylindrical recess (113) for receiving a shank (120) made at bottom of said bushing (12) and featuring four threaded holes (122) radially offset to one another by 90 degrees, aligned at a same height and set to match with an equal number of through holes (112) made in said basket like member (11), said through and threaded holes (112, 122) being crossed by said Allen screws (13) having heads (13a) remaining outside said basket like member (11) but touching the basket like member (11).
5. A device as claimed in claim 2 or 3, characterised in that said bushing (12) of said first element (10) has an axial bore (123) with a diameter such as to allow introduction and handling of one of said screw means (5, 6).

6. A device as claimed in claim 3, characterised in that a lower cylindrical portion (21) is made inside said barrel (21) for free coupling with outside of said basket like member (11).

7. A device as claimed in claim 3, characterised in that said plate (50) has a diameter almost equal to the diameter of said barrel (20) and has a threaded shaft (51) capable of coupling with a corresponding threading made in an axial bore (123) of said bushing (12).

8. A device as claimed in claim 1 or 3 or 4, characterised in that said joint means (40) include four overturned "V"-shaped notches (41) made along a lower end (25) of said barrel (20) and situated offset to one another by 90 degrees, for snap coupling with corresponding heads (13a) of said Allen screws (13), by action of elastic means (42) pushing downwards on said barrel (20), when the handlebar reaches one of said in-use position (M) and parking position (P), in which the central frusto-conical portion (22) of the barrel (20) is in abutment against said frusto-conical hub (121) of the bushing (12), said overturned "V"-shaped notches being capable of disengaging from said heads (13a) due to rotation of said handlebar (3) imposed while keeping the front wheel (4) firm, this way causing of said central frusto-conical portion (22) of the barrel (20) to raise from said frusto-conical hub (121) of the bushing (12) against the elastic reaction of said elastic means (42).

9. A device as claimed in claim 3 or 8, characterised in that said elastic means (42) include a helical spring placed between a front abutment (24) formed inside said barrel (20) and the shoulder (52) formed in said plate (50).

10. A device as claimed in claim 8, characterised in that said joint means (40) are capable of defining two parking positions (P), in which said handlebar is turned respectively right or left.

11. A device as claimed in claim 1 or 3 or 8, characterised in that said locking means (60) are associated to said plate (50) for defining an open position (H) of the plate, in which said shoulder (52) is moved away from top of said barrel (20), so that the barrel can move axially to engage and disengage said notches (41) with and from said heads (13a) of said Allen screws (13), and a closed position (K), in which the same shoulder (52) is in abutment against
the barrel (20) to prevent the barrel from raising and thus from rotating.

12. A device as claimed in claim 3 or 8 or 11, characterised in that said plate (50) has a threaded shank (51) capable of screw engagement with a corresponding thread made in an axial bore (123) of said bushing (12), said threaded shank (51) being composed of two parts, namely a first part (51A) and a second part (51B) mutually coupled in telescopic relation and joined by means of two threaded dowels with elastically loaded balls (61) radially fixed to said first part (51A) and capable of engaging respective helical tracks (62) made in said second part (51 B) and featuring respective ends with seats (63) for stabilising said elastically loaded balls (61) when the same plate is at said open position (H) and closed position (K) due to rotation of said second part (51 B) with respect to said first part (51A).

13. A device as claimed in claim 3 or 8 or 11, characterised in that said plate (50) has a threaded shank (51) capable of screw engagement with a corresponding thread made in an axial bore (123) of said bushing (12) to define, as a consequence of screwing or unscrewing said threaded shank in the said thread, said open position (H) and closed position (K) of the plate (50).

14. A device as claimed in claim 1, characterised in that key operated means (150) are provided for preventing relative movements between said first element (10) and said second element (20), to impede turning said handlebar (3) by unauthorised people from the parking position (P) to the in-use position (M).

15. A device as claimed in claim 14, characterised in that said key operated means (150) include a sector (151) made integral to said first element (10) and provided with an indent (152) matching with the parking position (P) to be engaged by a rotary hook (153) made in a key lock (154) associated to said second element (20).

16. A device as claimed in claim 1, characterised in that key operated means (150) are provided for preventing relative movements between said first element (10) and said second element (20), to impede turning said handlebar (3) by unauthorised people from the parking position (P) to the in-use position (M) and also to stabilise said parking and in-use positions in place of said locking means (60).

17. A device as claimed in claim 16, characterised in that said key operated
means (150) include a sector (151) made integral to said first element (10) and provided with an indent (152) offset with respect to one another by 90 degrees and matching with said parking position (P) and with said in-use position (M) respectively, said indents (152) being engaged alternatively by a rotary hook (153) made in a key lock (154) associated to said second element (20).

18. A device as claimed in claim 1 or 2, characterised in that said first element (10) includes a basket-like member (211) with a collar (212) at bottom designed to form a lower abutment for said second element (20), said second element including a cylinder (220) designed to be set on the same basket-like member (211), with a removable plug (250) placed on top of said basket-like member to enclose the top thereof.

19. A device as claimed in claim 1 or 18, characterised in that said joint means (240) are formed by a ferrule (241), interposed between said basket-like member (211) and cylinder (220), and sliding rings (242) placed both under said cylinder (220), between the cylinder and said collar (212), and above said cylinder (220), between the cylinder and said plug (250).

20. A device as claimed in claim 19, characterised in that said sliding rings (242) as well as said ferrule (241) have the task of eliminating axial and radial clearances between said basket-like member (211) and said cylinder (220).

21. A device as claimed in claim 1 or 18, or 19, characterised in that said locking means (260) include at least two flared holes (261) made at the same height in the outer side surface of said cylinder (220), offset with respect to one another by 90 degrees and positioned to match with said parking position (P) and with said in-use position (M) respectively, said flared holes (261) being designed so as to be engaged alternatively by a threaded pin (262) screwed into a threaded hole (214) made in a wing (213) protruding from said collar (212).

22. A device as claimed in claim 21, characterised in that said pin (262) is provided with a handling knob (263).