



US 20100248897A1

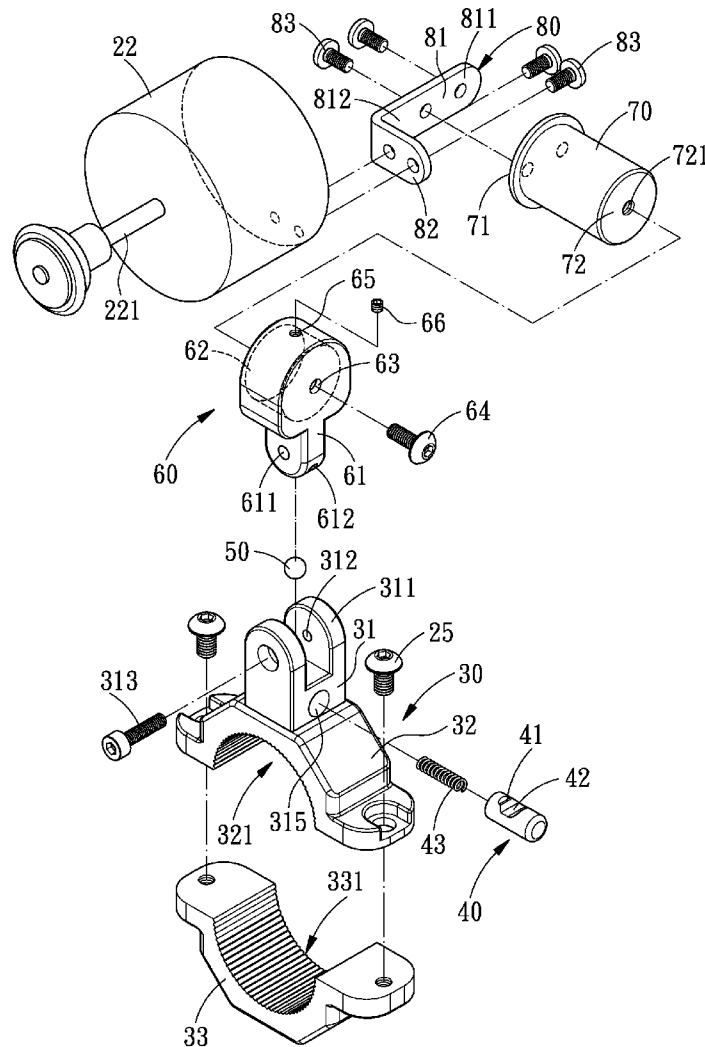
(19) **United States**(12) **Patent Application Publication**
Hsiao et al.(10) **Pub. No.: US 2010/0248897 A1**(43) **Pub. Date: Sep. 30, 2010**(54) **BICYCLE GENERATOR MOUNTING
STRUCTURE**(30) **Foreign Application Priority Data**

Mar. 24, 2009 (TW) 098109541

(76) Inventors: **Chi-Chang Hsiao**, Taichung
County (TW); **Hua-Ming Hsu**,
Taichung County (TW); **Qing-Zhi
Ding**, Taichung County (TW);
Jun-Hong Liu, Taichung County
(TW)**Publication Classification**(51) **Int. Cl.**
A63B 71/00 (2006.01)(52) **U.S. Cl.** **482/2**(57) **ABSTRACT**

A bicycle generator mounting structure comprises: a base, an adjusting member, a connecting member, and a flexible member. The adjusting member is disposed on and adjustable in position with respect to the base mounted on a bicycle frame. The connecting member is disposed on the adjusting member. The generator is connected to the connecting member via the flexible member which is capable of returning to its original shape after deformation, hence, the flexible member can absorb the noise caused when the bicycle is running and keep the generator in optimal contact with the wheel.

Correspondence Address:

Dr. BANGER SHIA**Patent Office of Bang Shia****102 Lindencrest Ct.****Sugar Land, TX 77479-5201 (US)**(21) Appl. No.: **12/729,236**(22) Filed: **Mar. 23, 2010**

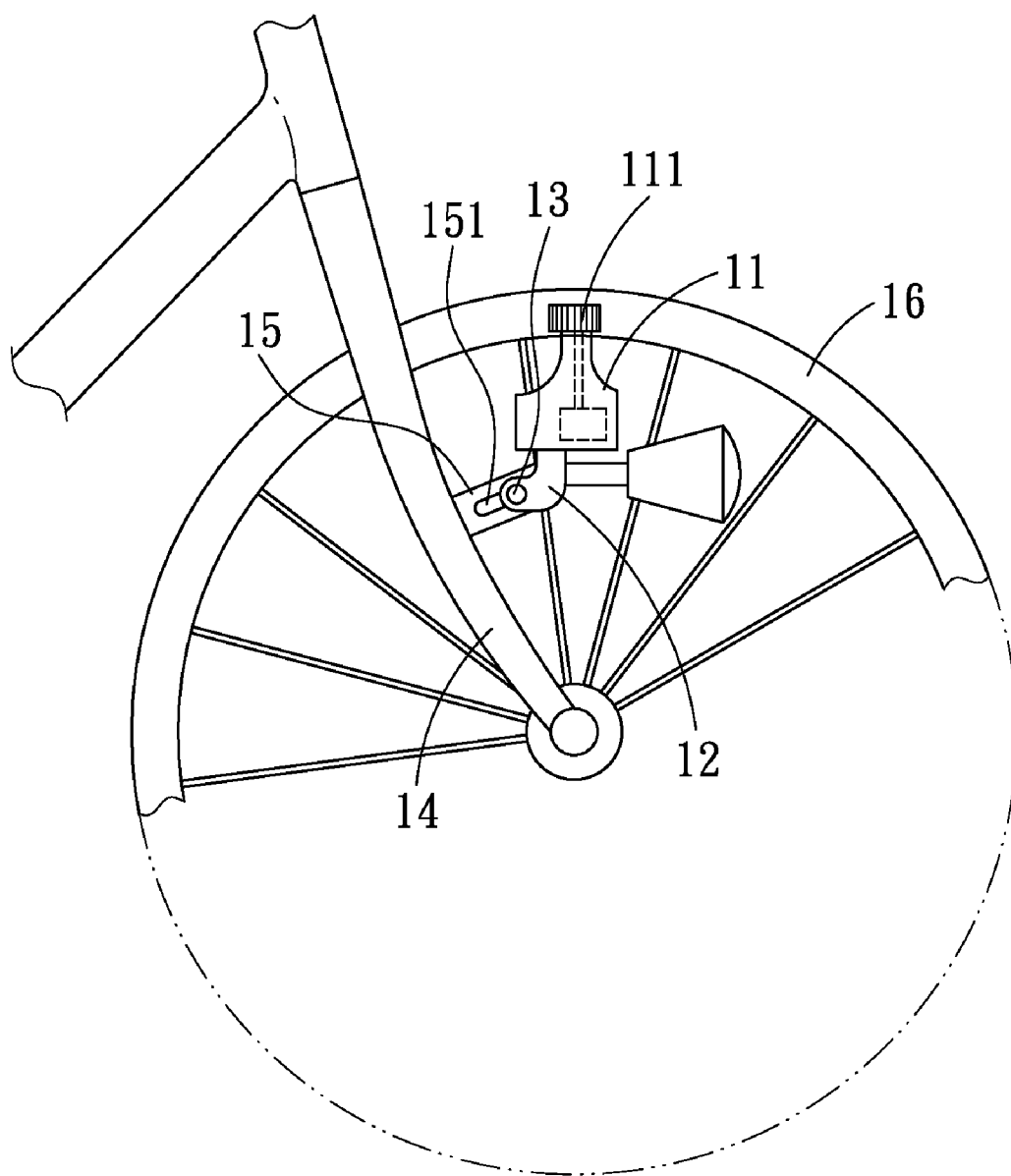


FIG. 1
PRIOR ART

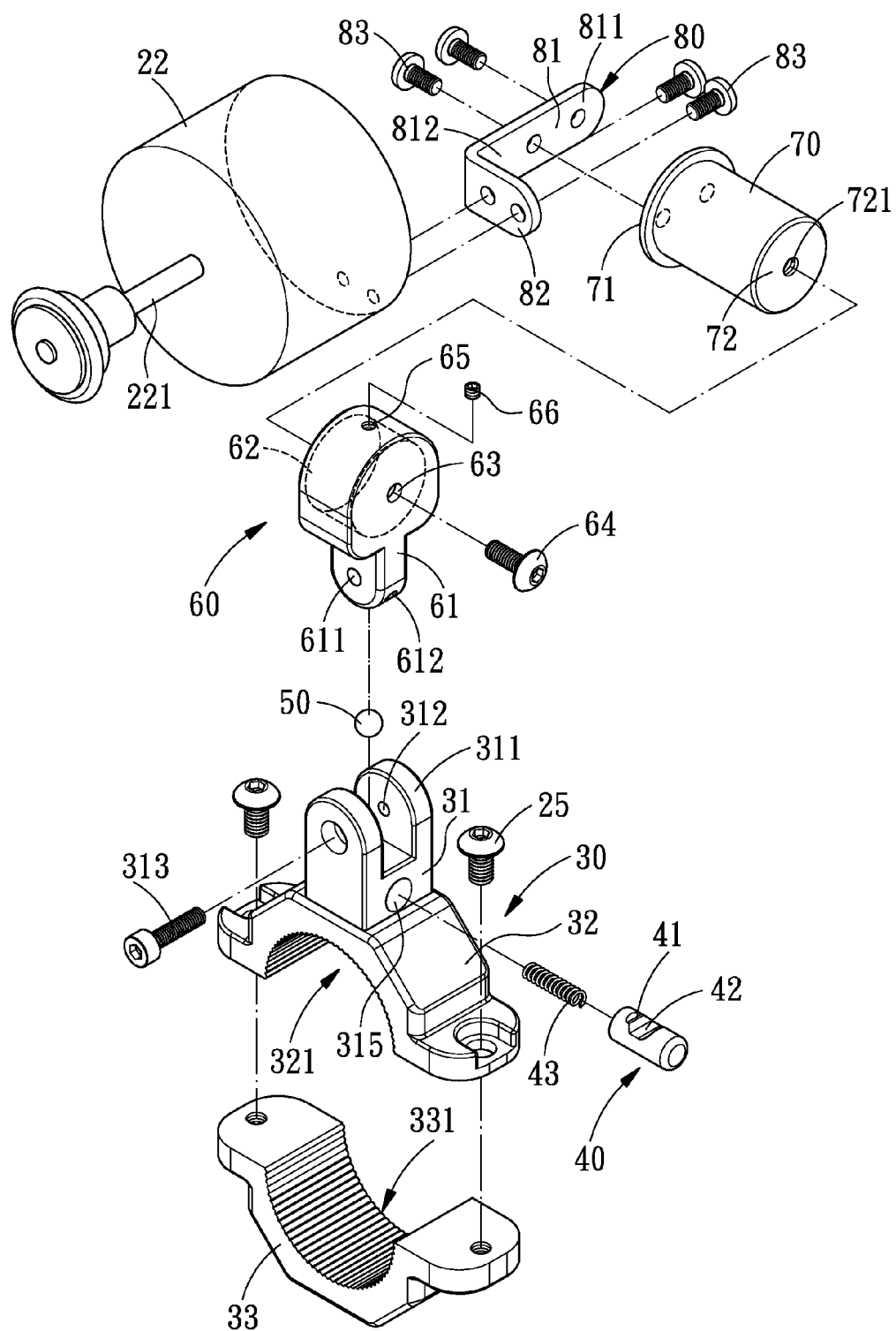


FIG. 2

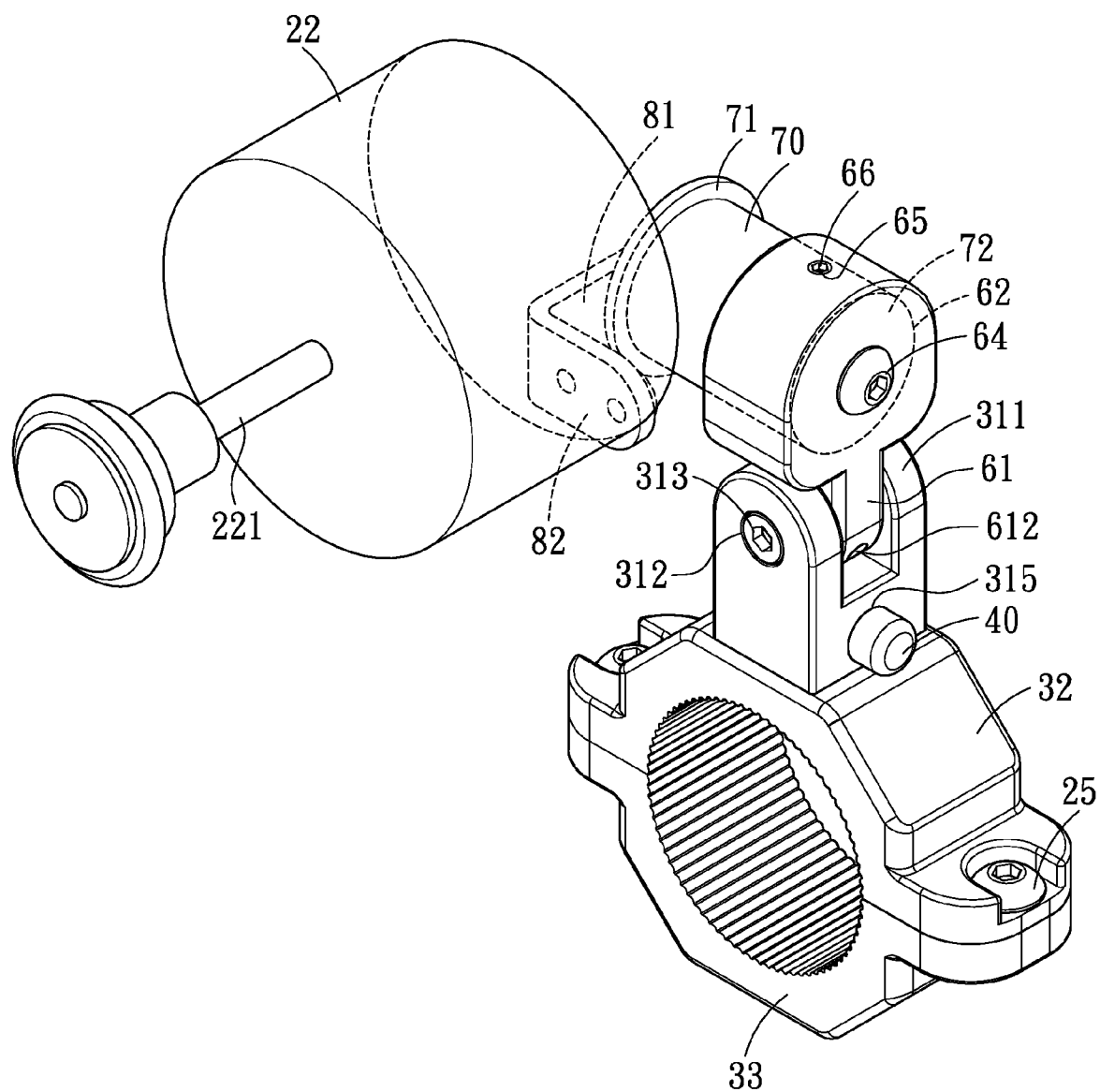


FIG. 3

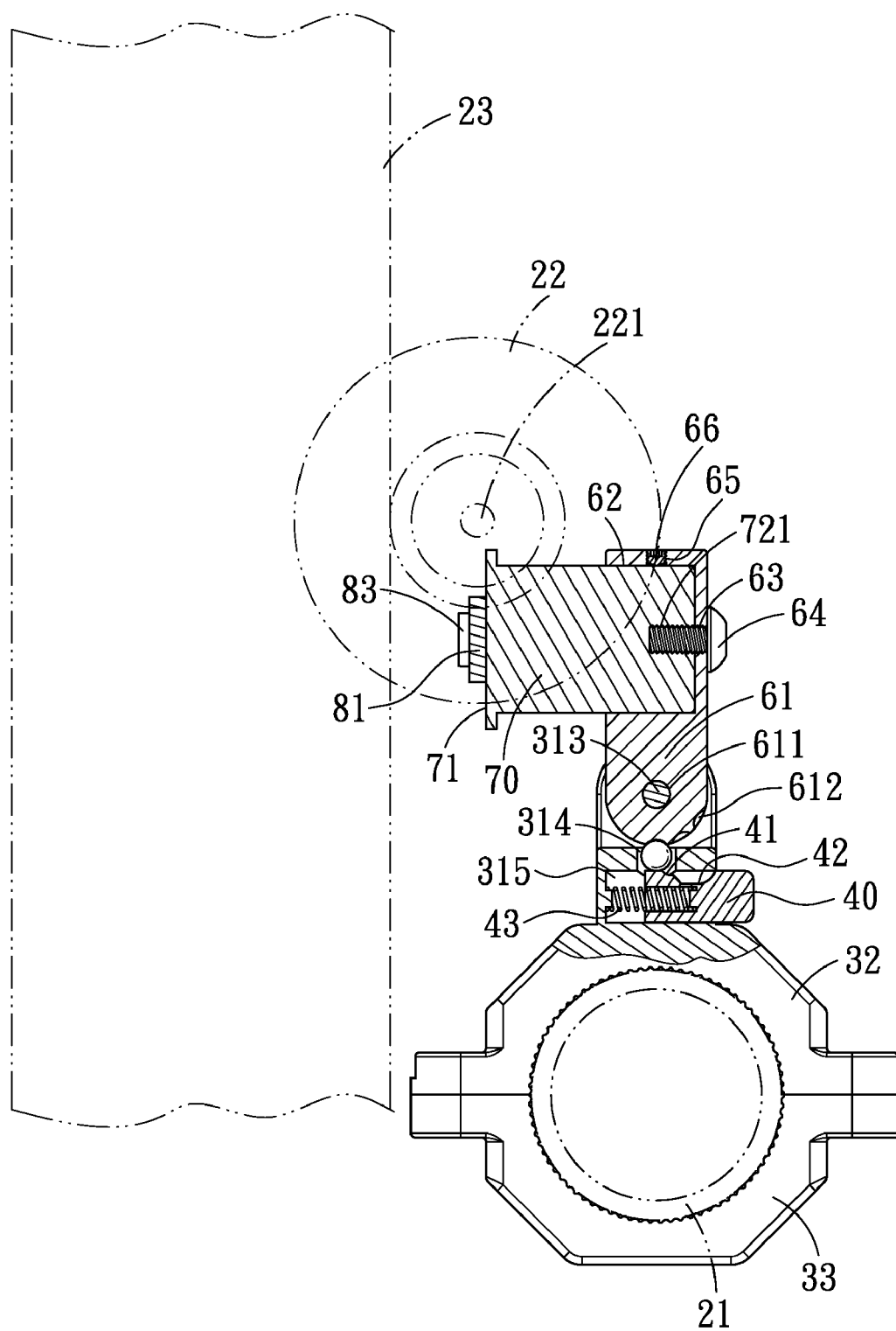


FIG. 4

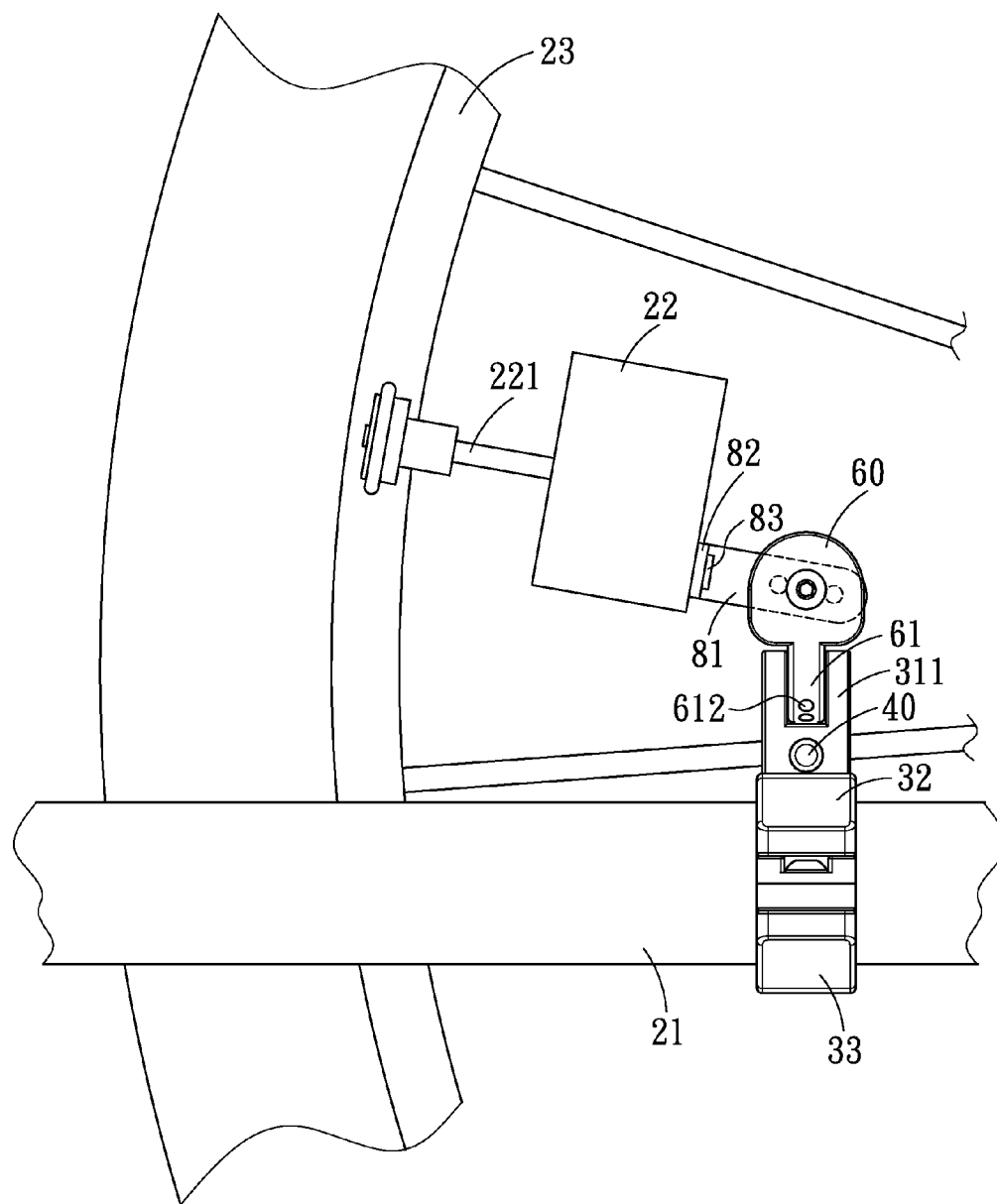


FIG. 5

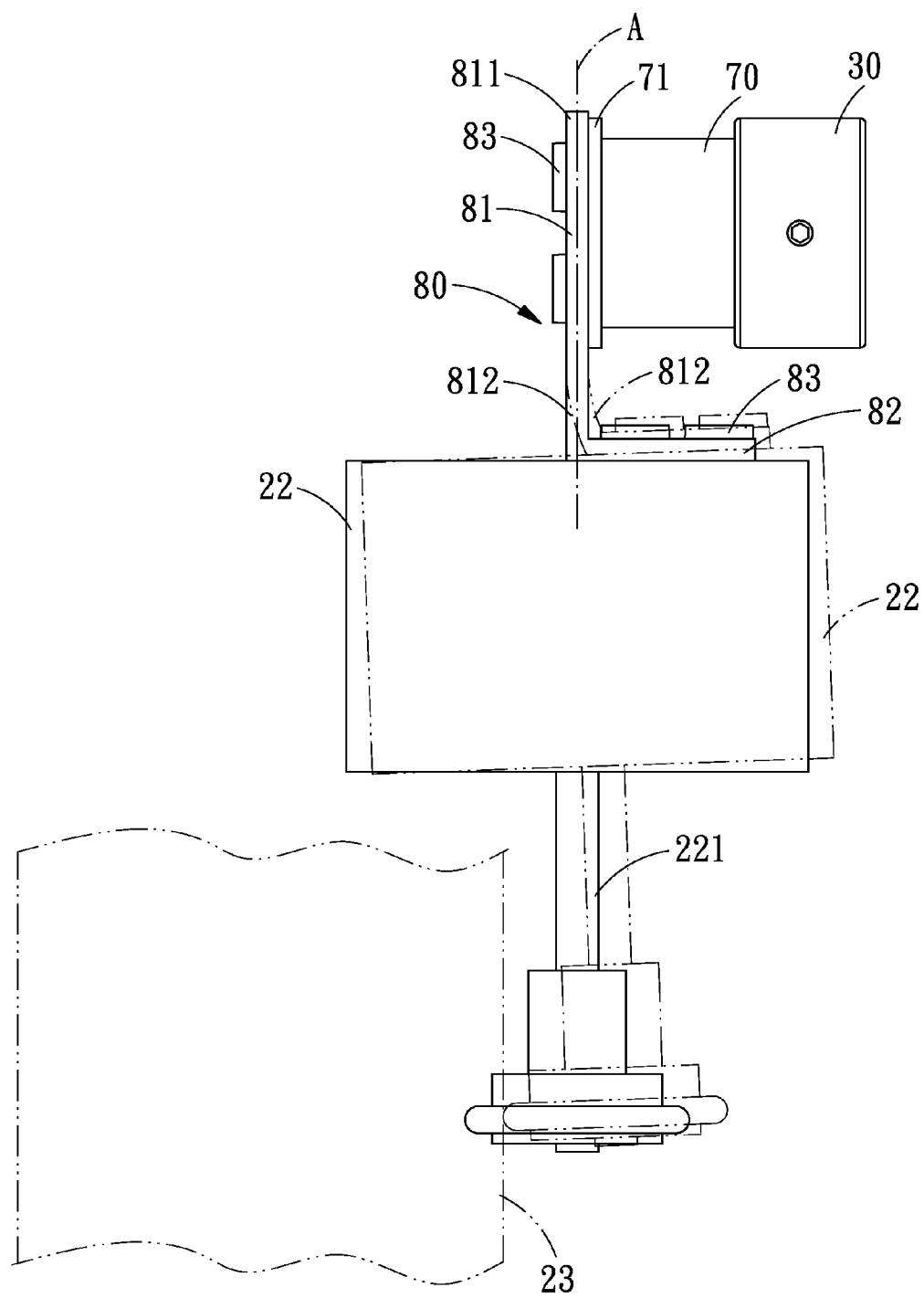


FIG. 6

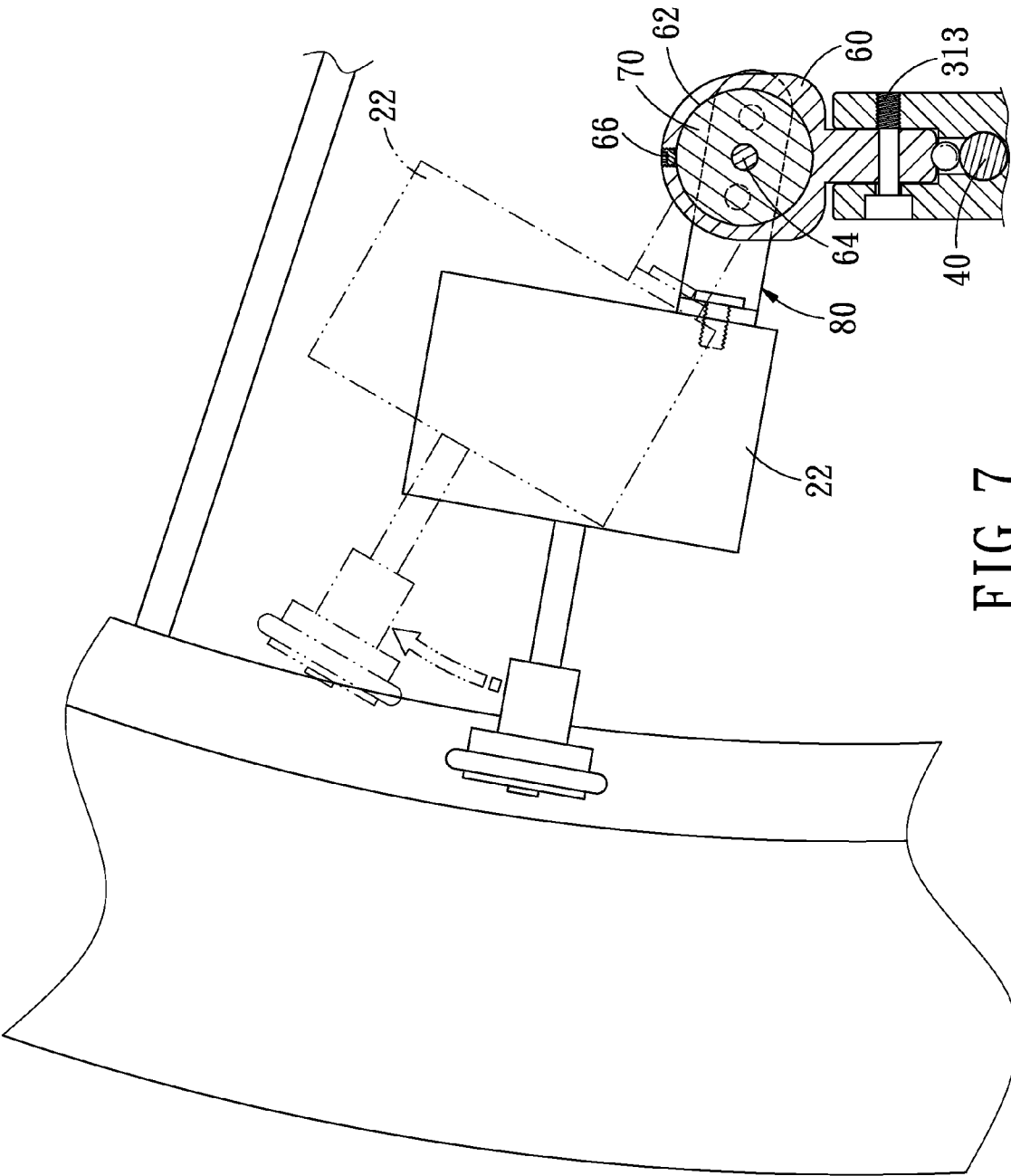


FIG. 7

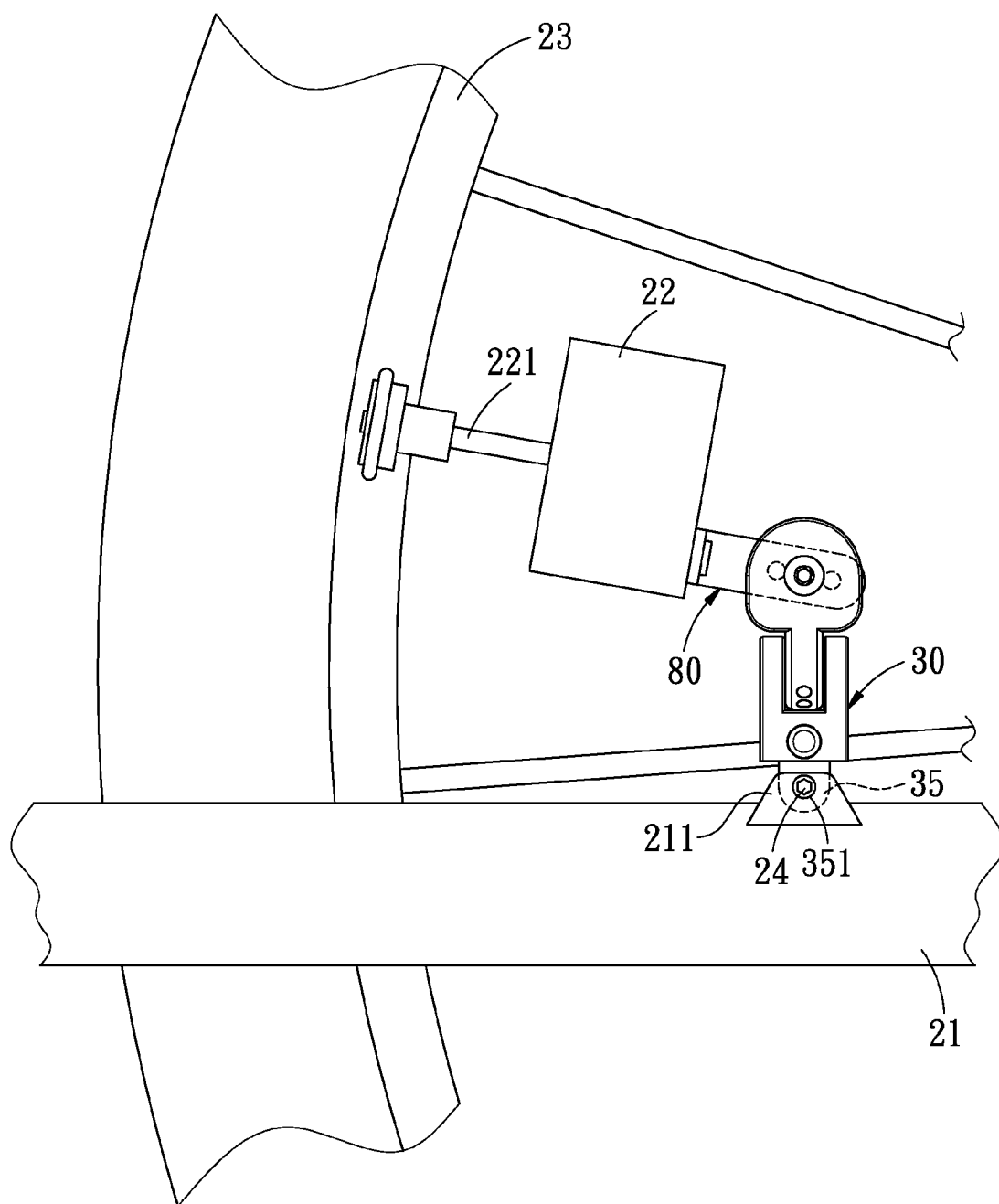


FIG. 8

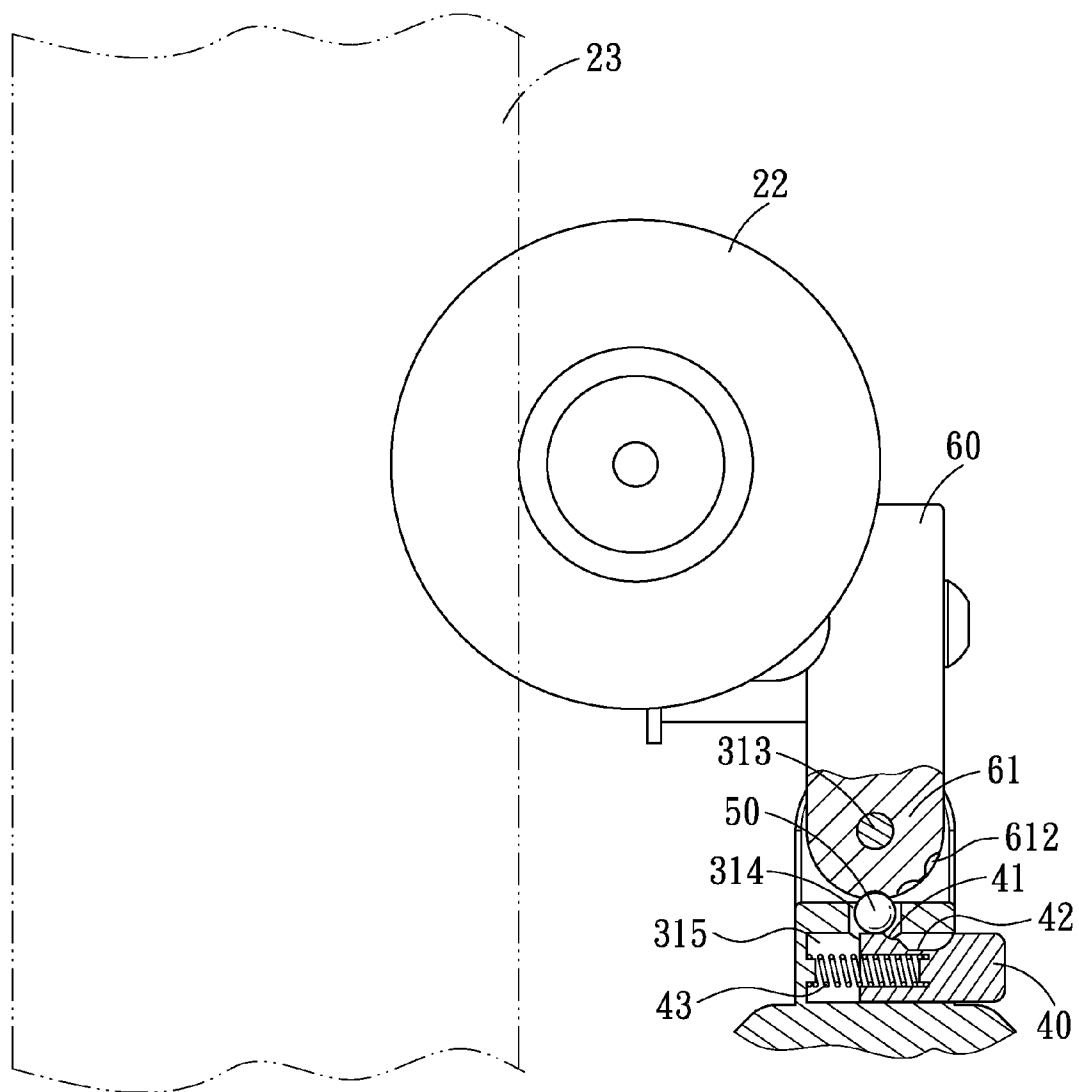


FIG. 9

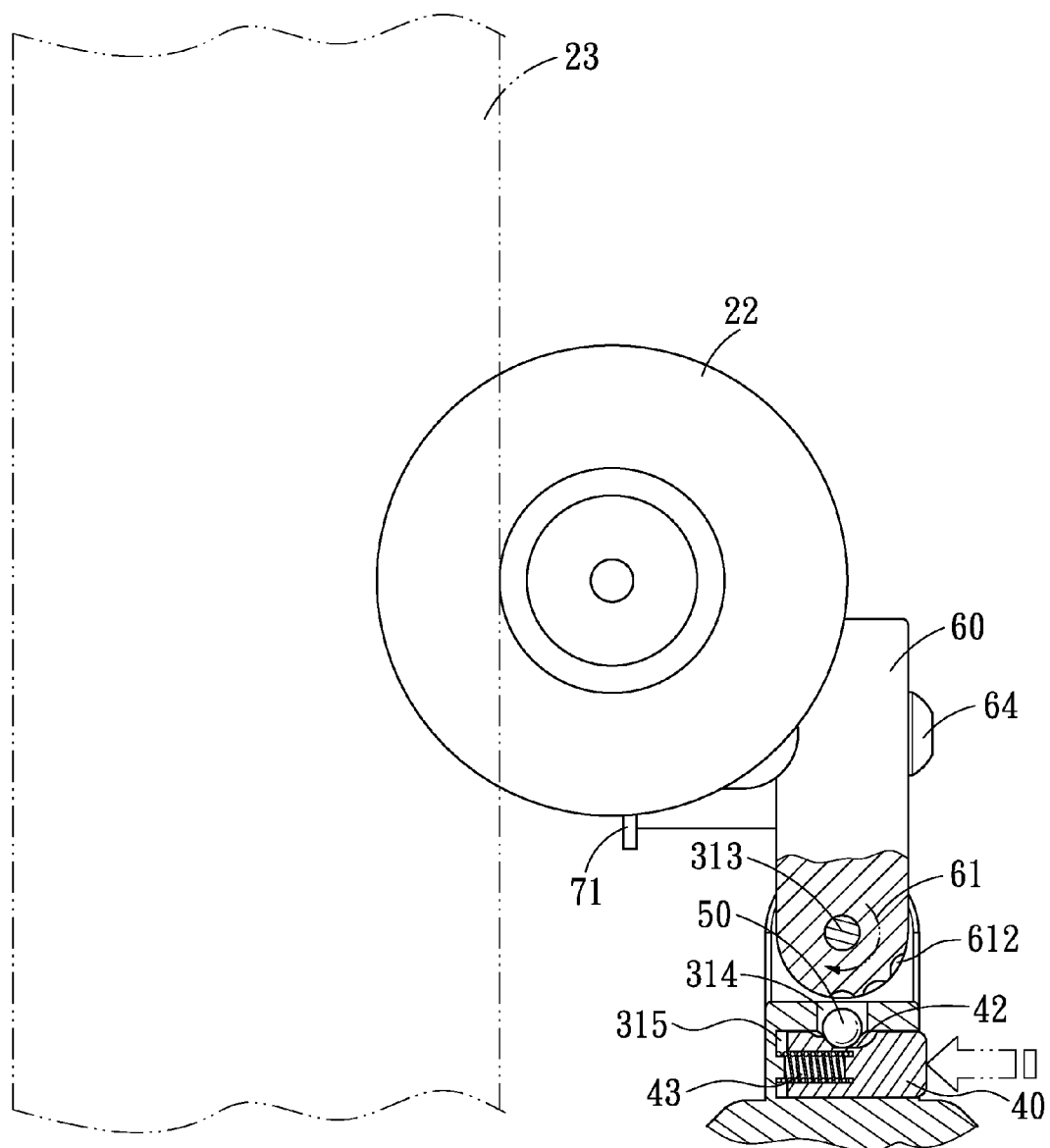


FIG. 10

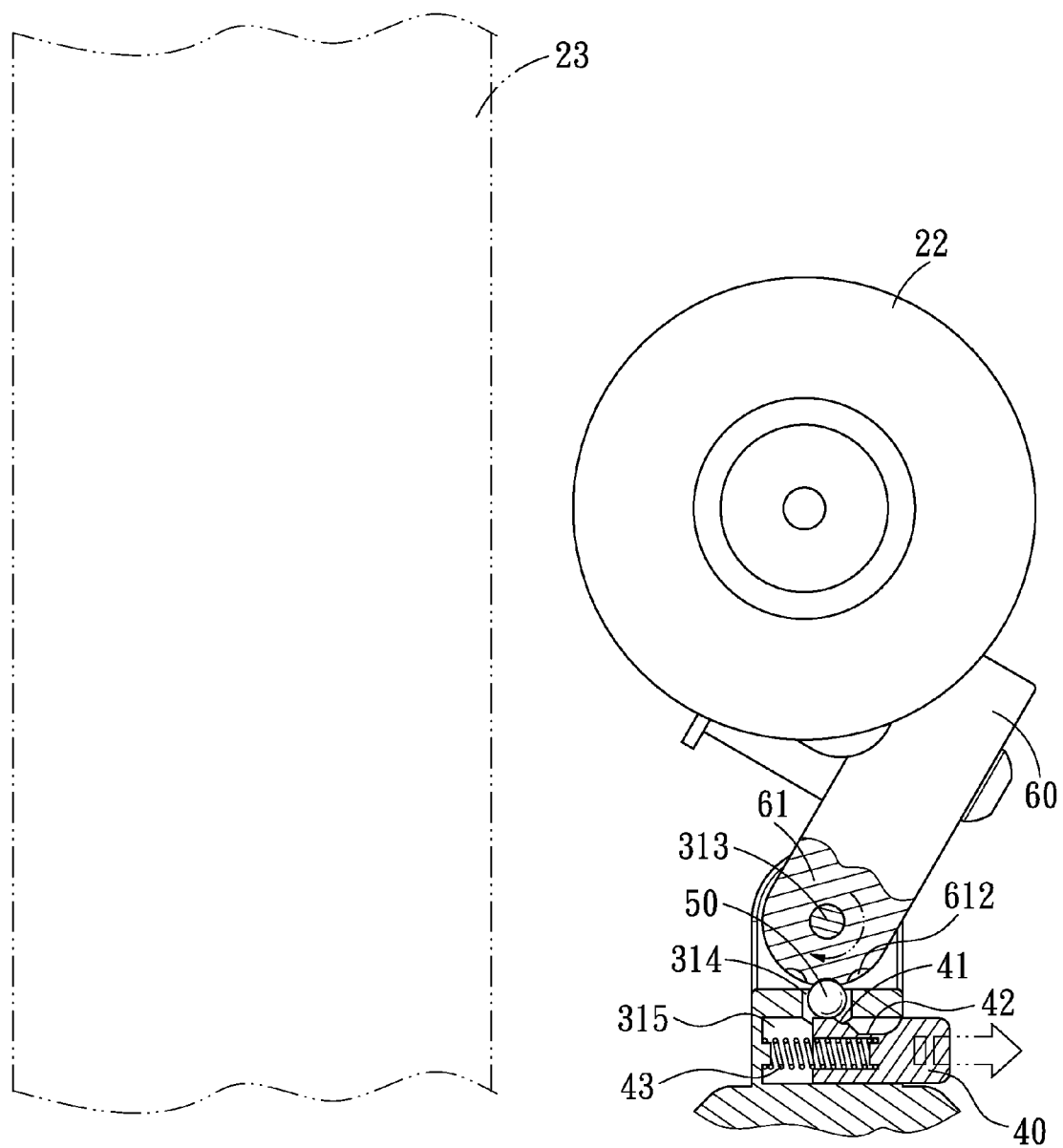


FIG. 11

BICYCLE GENERATOR MOUNTING STRUCTURE

BACKGROUND OF THE INVENTION

[0001] 1. Field of the Invention

[0002] The present invention relates to a generator mounting structure, and more particularly to a bicycle generator mounting structure for mounting a bicycle generator beside the sidewall of the wheel of a bicycle.

[0003] 2. Description of the Prior Art

[0004] As shown in FIG. 1, a generator **11** is mounted on a bicycle by a mounting structure **12** which is fixed to the fixing portion **15** of the bicycle fork **14** in such a manner that the driving shaft **111** of the generator **11** is in friction contact with the sidewall of the wheel **16**. This kind of generator **11** has the following disadvantages that need to be improved:

[0005] Since the generator **11**, the mounting seat **12** and the fixing portion **15** are connected in a rigid manner without any buffers or shock-absorbers, which is likely to produce noise and makes it impossible for the generator **11** to stay in optimal contact with the wheel **16** when the bicycle is running.

[0006] The present invention has arisen to mitigate and/or obviate the afore-described disadvantages.

SUMMARY OF THE INVENTION

[0007] The primary object of the present invention is to provide a bicycle generator mounting structure, wherein the generator is connected to the connecting member via a flexible member which is capable of returning to its original shape after deformation, the noise caused when the bicycle is running can be absorbed, and the generator can also be kept in optimal contact with the wheel.

[0008] To achieve the above object, a bicycle generator mounting structure is mounted on a bicycle frame for mounting a generator to a bicycle in such a manner that a driving shaft of the generator is in contact with a wheel of the bicycle to generate electric power, the bicycle generator mounting structure comprises: a base, an adjusting member, a connecting member, and a flexible member. The base is mounted on the bicycle frame. The adjusting member is disposed on and adjustable in position with respect to the base. The connecting member is disposed on the adjusting member and has a connecting end. The flexible member includes a first portion and a second portion, the second portion is flexible and provided with a first end and a second end, the first end is fixed to the connecting end of the connecting member, and the second end is connected to the second portion which is fixed to the generator. When the driving shaft of the generator is pressed against the wheel, and the flexible member is caused to deform, the second end of the flexible member will produce an opposite acting force to keep the generator in optimal contact with the wheel, and when the driving shaft of the generator disengages from the wheel, the flexible member will return to its original shape.

BRIEF DESCRIPTION OF THE DRAWINGS

[0009] FIG. 1 is an illustrative view of a conventional bicycle generator mounting structure;

[0010] FIG. 2 is an exploded view of a bicycle generator mounting structure in accordance with the present invention;

[0011] FIG. 3 is an assembly view of the bicycle generator mounting structure in accordance with the present invention;

[0012] FIG. 4 is a cross sectional view of a part of FIG. 3;

[0013] FIG. 5 is an operational view showing that the bicycle generator mounting structure in accordance with the present invention is mounted on a bicycle;

[0014] FIG. 6 is a top view showing that the flexible member of the bicycle generator mounting structure in accordance with the present invention is being pressed;

[0015] FIG. 7 shows that the connecting member of the bicycle generator mounting structure in accordance with the present invention is being adjusted relative to the adjusting member;

[0016] FIG. 8 is another assembly view of the bicycle generator mounting structure in accordance with the present invention;

[0017] FIG. 9 is an illustrative view of the bicycle generator mounting structure in accordance with the present invention before the releasing member is pressed;

[0018] FIG. 10 is an illustrative view of the bicycle generator mounting structure in accordance with the present invention after the releasing member is pressed, and the ball is disengaged from the adjusting member; and

[0019] FIG. 11 is an illustrative view of the bicycle generator mounting structure in accordance with the present invention, wherein the angle of the generator has been adjusted by the adjusting member.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0020] The present invention will be clearer from the following description when viewed together with the accompanying drawings, which show, for purpose of illustrations only, the preferred embodiment in accordance with the present invention.

[0021] Referring to FIGS. 2-6, a bicycle generator mounting structure in accordance with a preferred embodiment of the present invention is fixed to a bicycle frame **21** for mounting a bicycle generator **22** to the bicycle in such a manner that a driving shaft **221** of the generator **22** is in contact with a sidewall of a wheel **23** of the bicycle. The bicycle generator mounting structure comprises a base **30**, a releasing member **40**, a ball **50**, an adjusting member **60**, a connecting member **70** and a flexible member **80**.

[0022] The base **30** includes an upper member **32**, a lower member **33** and a pivoting portion **31** formed on an outer surface of the upper member **32**. At one end of the pivoting portion **31** are formed two pivoting pieces **311** each of which is formed with a pivoting hole **312** for insertion of a bolt **313**. In a bottom of the pivoting portion **31** is axially formed a cavity **314** and radially formed an assembling hole **315** in communication with the cavity **314**. The upper and lower members **32**, **33** each are formed with a clamping notch **321**, **331** which engages with the outer surface of the bicycle frame **21**, and then screws **25** are used to lock the upper and lower members **32**, **33** together, making the upper and lower members **32**, **33** clamp against the bicycle frame **21**.

[0023] The releasing member **40** is formed with a protruding portion **41** and a concave **42** and disposed in the assembling hole **315** of the base **30** after a spring **43** is put in the assembling hole **315**, and one end of the releasing member **40** protrudes out of the assembling hole **315**.

[0024] The ball **50** is disposed in the cavity **314** of the base **30** and selectively in contact with the protruding portion **41** or the concave **42** of the releasing member **40** via the assembling hole **315**.

[0025] The adjusting member 60 is formed at the bottom thereof with a protruding pivoting portion 61 in which is defined a pivoting hole 611. In the outer end surface of the protruding pivoting portion 61 are formed a plurality of positioning cavities 612. The protruding pivoting portion 61 of the adjusting member 60 is disposed between the two pivoting pieces 311 of the base 30, and then the bolt 313 is inserted through the pivoting portions 31, 61 to pivotally connect the adjusting member 60 to the base 30 in such a manner that the ball 50 is selectively engaged with one of the positioning cavities 612 to position the adjusting member 60 with respect to the base 30. In a side surface of the adjusting member 60 is formed a circular hole 62, at a bottom of the circular hole 62 is formed a hole 63 running to an outer surface of the adjusting member 60 for engaging with a locking screw 64. In an inner surface of the circular hole 62 is further formed a threaded hole 65 running to the outer surface of the adjusting member 60 for engaging with a countersunk screw 66.

[0026] The connecting member 70 in the form of a circular cylinder includes a first connecting end 71 and a second connecting end 72. The second connecting end 72 is formed with an engaging hole 721. The connecting member 70 is disposed in the circular hole 62 of the adjusting member 60 in such a manner that the first connecting end 71 extends out of the adjusting member 60, and the locking screw 64 is screwed in the second connecting end 72 to connect the connecting member 70 to the adjusting member 60. Meanwhile, the countersunk screw 66 is screwed in the threaded hole 65 and pressed against the outer surface of the connecting member, so as to prevent the connecting member 70 from rotating within the circular hole 62.

[0027] The flexible member 80 is an L-shaped steel plate with elasticity and capable of returning to original shape after deformation. The long part of the flexible member 80 is defined as a first portion 81 while the short part of the flexible member 80 is defined as a second portion 82. The first portion 81 has a great elasticity and includes a first end 811 and a second end 812. The first end 811 is fixed to the first connecting end 71 of the connecting member 70 by screws 83, and the second end 812 is connected to the second portion 82. The second portion 82 is fixed to the generator 22 by screws 83.

[0028] It is noted that, as shown in FIG. 6, the first part 81 of the flexible member 80, in normal conditions, has a datum line A running through the first and second ends 811, 812. The first end 811 is considered as a fixed end, and when the second end 812 deviates from the datum line A, an opposite acting force will be produced to make the second end 812 return to its original position.

[0029] The abovementioned are the relations of the essential components of the present invention, for a better understanding of the operation and function of the present invention, reference should be made to FIGS. 2 and 6. The generator 22 is fixed on the generator mounting structure of the present invention by the flexible member 80. Since the flexible member 80 is capable of regaining its original shape after deformation, when the driving shaft 221 of the generator 22 presses against the wheel 23, forcing the flexible member 80 to deform, namely, the first end 811 is fixed, and the second end 812 deviates from the datum line A, an opposite acting force will be produced to make the second end 812 return back to the datum line A. Hence, when the bicycle is running, the flexible member 80 serves to absorb the noise caused by the vibration of the wheel 23, the generator 22 and the generator mounting structure, and the second end 812 of the

flexible member 80 can produce an opposite acting force to keep the generator 22 in optimal contact with the wheel 23. When the driving shaft 221 of the generator 22 disengages from the wheel 23, the flexible member 80 will return to its original shape.

[0030] Furthermore, with the structural design of the present invention, the user can easily adjust the angle or position of the generator 22 with respect to the wheel 23 to an optimal condition, so that the generator 22 can be adapted to different types of wheels 23. Referring to FIGS. 2, 4 and 7 again, the generator 22 is connected to the connecting member 70 via the flexible member 80, loosening the countersunk screw 66 and the locking screw 64 can allow the connecting member 70 to rotate within the circular hole 62 of the adjusting member 60, so that the connecting member 70 can be adjusted to bring the generator 22 into optimal contact with the wheel 23, and then the countersunk screw 66 and the locking screw 64 are screwed tight again to not allow the connecting member 70 to rotate with respect to the adjusting member 60, and thus fixing the generator 22 at a desired position.

[0031] Referring then to FIG. 8, the base 30 is provided at its bottom with an ear 35, and in the ear 35 is formed a locking hole 351, so that the present invention is adapted to the bicycle which has been provided with a generator 22 already. Since the bicycle frame 21 is provided with a fixing portion 211, the generator 22 can be removed from the bicycle in advance, and then the ear 35 of the base 30 can be fixed to the fixing portion 211 by a locking member 24, and finally, the generator 22 is fixed to the flexible member 80. Likewise, the noise caused when the bicycle is running can be absorbed, and the generator 22 can also be kept in optimal contact with the wheel 23.

[0032] Referring finally to FIGS. 9, 10 and 11, to disengage the generator 22 from the wheel 23, the user can press the releasing member 40 to disengage the protruding portion 41 of the releasing member 40 from the ball 50, meanwhile, the ball 50 sinks into the concave 42, at this moment, the pivoting portion 61 of the adjusting member 60 and the pivoting portion 31 of the base 30 are rotatable about the bolt 313, so that the adjusting member 60 can be rotated to a disengaged position. After that, the user releases the previously-pressed releasing member 40, and the releasing member 40 will be pushed back to its original position by the spring 43. In the outer end surface of the protruding pivoting portion 61 are formed the plurality of positioning cavities 612, therefore, the protruding portion 41 of the releasing member 40 will push the ball 50 into a desired one of the positioning cavities 612, the generator 22 is thus disengaged from the wheel 23. By such arrangements, the generator 22 of the present invention can be adjusted to an operational position in which the generator 22 is in contact with the wheel 23 or to a disengaged position in which the generator 22 is disengaged from the wheel 23.

[0033] While we have shown and described various embodiments in accordance with the present invention, it is clear to those skilled in the art that further embodiments may be made without departing from the scope of the present invention.

What is claimed is:

1. A bicycle generator mounting structure mounted on a bicycle frame for mounting a generator to a bicycle in such a manner that a driving shaft of the generator is in contact with a wheel of the bicycle to generate electric power, the bicycle generator mounting structure comprising:

a base mounted on the bicycle frame;
 an adjusting member disposed on and adjustable in position with respect to the base;
 a connecting member disposed on the adjusting member and having a connecting end; and
 a flexible member including a first portion and a second portion, the second portion being flexible and provided with a first end and a second end, the first end being fixed to the connecting end of the connecting member, and the second end being connected to the second portion which is fixed to the generator;
 when the driving shaft of the generator is pressed against the wheel, and the flexible member is caused to deform, the second end of the flexible member will produce an opposite acting force to keep the generator in optimal contact with the wheel, and when the driving shaft of the generator disengages from the wheel, the flexible member will return to its original shape.

2. The bicycle generator mounting structure as claimed in claim 1, wherein the flexible member is L-shaped and includes a long part and a short part, the long part is the first portion, and the short part is the second portion.

3. The bicycle generator mounting structure as claimed in claim 1, wherein a circular hole is formed in a side surface of the adjusting member, and the connecting member is disposed in the circular hole of the adjusting member in such a manner that the connecting end of the connecting member extends out of the adjusting member.

4. The bicycle generator mounting structure as claimed in claim 2, wherein a circular hole is formed in a side surface of

the adjusting member, and the connecting member is disposed in the circular hole of the adjusting member in such a manner that the connecting end of the connecting member extends out of the adjusting member.

5. The bicycle generator mounting structure as claimed in claim 3, wherein a hole running to an outer surface of the adjusting member for engaging with a locking screw is formed at a bottom of the circular hole, so as to fix the connecting member to the adjusting member by the locking screw, a threaded hole running to the outer surface of the adjusting member for engaging with a countersunk screw is formed in an inner surface of the circular hole, the countersunk screw is screwed in the threaded hole and pressed against an outer surface of the connecting member, so as to prevent the connecting member from rotating within the circular hole.

6. The bicycle generator mounting structure as claimed in claim 4, wherein a hole running to an outer surface of the adjusting member for engaging with a locking screw is formed at a bottom of the circular hole, so as to fix the connecting member to the adjusting member by the locking screw, a threaded hole running to the outer surface of the adjusting member for engaging with a countersunk screw is formed in an inner surface of the circular hole, the countersunk screw is screwed in the threaded hole and pressed against an outer surface of the connecting member, so as to prevent the connecting member from rotating within the circular hole.

* * * * *