A training apparatus for a bicycle has a base, a transmitting device and a damping device. The base has a holding mount and a supporting frame. The transmitting device is mounted on the base and has an axle assembly, a rotating axle, multiple belt pulleys, a belt and a chain wheel group. The axle assembly is mounted through the supporting frame. The rotating axle is mounted through the supporting frame. The belt pulleys are mounted between the axle assembly and the rotating axle. The belt is mounted around the belt pulleys. The damping device is mounted on the base, is mounted around the rotating axle and has a damping wheel, a magnetizer and an adjusting assembly. The damping wheel is mounted around the rotating axle. The magnetizer is connected to the supporting frame around the damping wheel. The adjusting assembly is connected to the supporting frame and the magnetizer.
TRAINING APPARATUS FOR A BICYCLE

BACKGROUND OF THE INVENTION

[0001] (1) Field of the Invention
[0002] The present invention relates to a training apparatus and more particularly to a training apparatus for a bicycle that can provide a preferred training effect, can reduce the abrasion of wheels of the bicycle, can reduce the noise in use and can save space when storing or transporting the training apparatus.

[0003] (2) Description of the Prior Art

[0004] A conventional training apparatus for a bicycle has a base, three rollers and multiple belts. The rollers are rotatably mounted on the base at intervals. The belts are mounted between the rollers to link the rollers with each other. In use, a rear wheel of a bicycle is mounted between two of the rollers and a front wheel of the bicycle is mounted on the other one roller. When a person rides the bicycle, the rear wheel will make the rollers rotating by the belts to simulate the actual riding status. However, the wheels of the bicycle are mounted between the rollers of the conventional training apparatus, the height of the bicycle on the conventional training apparatus is higher than the actual height of the bicycle on the ground. Then, the person needs a span to get with the altitudinal difference between the conventional training apparatus and the bicycle and this will influence the training effect of the person. Especially, the wheels of the bicycle are directly mounted on and about the rollers and this will increase the abrasion of the wheels of the bicycle. In addition, the vibration that made from the rotation between the wheels and the rollers will make noises. Furthermore, the conventional training apparatus is mounted below the wheels of the bicycle and has a large volume, then transporting and carrying the conventional training apparatus is inconvenient.

[0005] Another conventional training apparatus has a supporting frame and a resisting roller. The supporting frame has two ends to hold the wheel axle of the real wheel of the bicycle to support the rear wheel of the bicycle. The resisting roller is rotatably mounted on the supporting frame and abuts against the rear wheel. Then, a person can use the resistance force that provided by the resisting roller to train. However, the rear wheel of the bicycle is supported by the supporting frame and is higher than the front wheel of the bicycle, and this is different from the actual riding status. Then, the training effect of the person will be influenced by the simulated riding status. Especially, the rear wheel of the bicycle is directly mounted on and abuts the resisting roller and this will increase the abrasion of the rear wheel of the bicycle. In addition, the vibration that made from the rotation between the rear wheel and the resisting roller will make noises.

[0006] A training apparatus for a bicycle in accordance with the present invention mitigates or obviates the aforementioned problems.

SUMMARY OF THE INVENTION

[0007] The main objective of the present invention is to provide a training apparatus for a bicycle that can provide a preferred training effect, can reduce the abrasion of wheels of the bicycle, can reduce the noise in use and can save space when storing or transporting the training apparatus.

[0008] The training apparatus for a bicycle has a base, a transmitting device and a damping device. The base has a holding mount and a supporting frame. The supporting frame is mounted on the holding mount. The transmitting device is rotatably mounted on the base and has an axle assembly, a major belt pulley, a rotating axle, a minor belt pulley, a belt and a chain wheel group. The axle assembly is mounted through the supporting frame. The major belt pulley is rotatably mounted around the axle assembly. The rotating axle is rotatably mounted through the supporting frame below the major belt pulley. The minor belt pulley is mounted around the rotating axle. The belt is mounted around the belt pulleys. The chain wheel group is rotatably mounted around the axle assembly and is securely connected to the major belt pulley. The damping device is mounted on the supporting frame of the base, is mounted around the rotating axle of the transmitting device ad has a damping wheel, a magnetizer and an adjusting assembly. The damping wheel is securely mounted around the rotating axle opposite to the minor belt pulley. The magnetizer is curved, is movably connected to the supporting frame around the damping wheel to provide a resistance force to the damping wheel. The adjusting assembly is connected to the supporting frame and the magnetizer.

[0009] Other objectives, advantages and novel features of the invention will become more apparent from the following detailed description when taken in conjunction with the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

[0010] FIG. 1 is a perspective view of a training apparatus for a bicycle in accordance with the present invention;
[0011] FIG. 2 is another perspective view of the training apparatus in FIG. 1;
[0012] FIG. 3 is an operational perspective view of the training apparatus in FIG. 1 when the training apparatus is mounted on a bicycle;
[0013] FIG. 4 is an enlarged perspective view of the training apparatus in FIG. 3 mounted on the bicycle;
[0014] FIG. 5 is a cross section top view of the training apparatus in FIG. 1;
[0015] FIG. 6 is an exploded perspective view of the training apparatus in FIG. 1;
[0016] FIG. 7 is a top view in partial section of the training apparatus in FIG. 4 mounted on the bicycle;
[0017] FIG. 8 is another exploded perspective view of the training apparatus in FIG. 2;
[0018] FIG. 9 is an enlarged exploded perspective view of the training apparatus in FIG. 8; and
[0019] FIG. 10 is an operational side view of the training apparatus in FIG. 1.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0020] With reference to FIGS. 1 to 5, a training apparatus in accordance with the present invention is used on a bicycle 4 having a rear fork 41 with two ends and two holding grooves 43, a chain 41 and a rear wheel 42, and the training apparatus comprises a base 1, a transmitting device 2 and a damping device 3.

[0021] The base 1 has a holding mount 10 and a supporting frame 11. The holding mount 10 is mounted on the ground and has a top surface. The supporting frame 11 is mounted on the top surface of the holding mount 10, may be detachably mounted on the holding mount 10 and has a free end, a first sidewall, an external surface, a second sidewall and an elongated hole 12. The external surface of the supporting frame 11...
is formed between the sidewalls of the supporting frame 11. The elongated hole 12 is formed through the sidewalls of the supporting frame 11 between the free end of the supporting frame 11 and the holding mount 10.

[0022] The transmitting device 2 is rotatably mounted on the base 1 and has an axle assembly 20, a major belt pulley 21, a rotating axle 22, a minor belt pulley 23, a belt 24, a chain wheel group 25, an idle wheel 26 and an adjusting screw 27.

[0023] With reference to FIGS. 6 and 7, the axle assembly 20 is mounted through the free end of the supporting frame 11, is used to hold the free ends of the rear fork 40 of the bicycle 4 and has a connecting sleeve 50, an axle tube 51, an axle lid 52, a quick release shaft 55, an operating stem 56, a clipping block 54 and a slide block 53. The connecting sleeve 50 is securely mounted on the supporting frame 11 near the free end of the supporting frame 11, extends out of the second sidewall of the supporting frame 11 and has an inner end, an outer end and an inner threaded hole 500. The inner end of the connecting sleeve 50 is securely mounted in the supporting frame 11. The outer end of the connecting sleeve 50 extends out of the second sidewall of the supporting frame 11. The inner threaded hole 500 is formed through the ends of the connecting sleeve 50.

[0024] The axle tube 51 is securely mounted in the connecting sleeve 50, extends out of the ends of the connecting sleeve 50 and has a first end, a second end, an external surface, a first engaging section 510, an axle section 511, a threaded section 513 and an axle hole 512. The first end of the axle tube 51 extends out of the first sidewall of the supporting frame 11. The second end of the axle tube 51 extends out of the second sidewall of the supporting frame 11. The first engaging section 510 is formed in the external surface of the axle tube 51 near the second end of the axle tube 51 and engages one of the holding grooves 43 of the rear fork 40 of the bicycle 4. The axle section 511 is formed on the external surface of the axle tube 51 near the first end of the axle tube 51 and extends out of the first sidewall of the supporting frame 11. The threaded section 513 is formed around the external surface of the axle tube 51 between the first engaging section 510 and the axle section 511 and is screwed with the inner threaded hole 500 of the connecting sleeve 50 to connect the axle tube 51 with the connecting sleeve 50. Then, the axle tube 51 can be securely connected to the connecting sleeve 50 by the engagement between the inner threaded hole 500 of the connecting sleeve and the threaded section 513 of the axle tube 51. In addition, different lengths, sizes and purposes (for roads bicycles, climbing bicycles, racing bicycles ...) (etc.) of the axle tube 51 can be replaced and connected to the connecting sleeve 50 easily and conveniently. The axle hole 512 is formed through the ends of the axle tube 51.

[0025] The axle lid 52 is securely connected to the axle tube 51, is mounted around the axle section 511 of the axle tube 51 and has an inner end, an outer end, a second engaging section 520 and a lid hole 521. The inner end of the axle lid 52 is connected to the first end of the axle tube 51. The second engaging section 520 is formed around the outer end of the axle lid 52 and engages the other holding groove 43 of the rear fork 40 of the bicycle 4. The lid hole 521 is formed through the ends of the axle lid 52.

[0026] The quick release shaft 55 is mounted through the lid hole 521 of the axle lid 52 and the axle hole 512 of the axle tube 51 and has a mounting end, a connecting end and a pivot segment 550. The mounting end of the quick release shaft 55 extends out of the second end of the axle tube 51. The connecting end of the quick release shaft 55 extends out of the axle lid 52. The pivot segment 550 is formed in the connecting end of the quick release shaft 55. The operating stem 56 is rotatably connected to the connecting end of the quick release shaft 55 and has an eccentric segment 560 and a stem segment 561. The eccentric segment 560 is pivotally connected to the pivot segment 550 of the quick release shaft 55. The stem segment 561 is formed with the eccentric segment 560 of the operating stem 56 to enable the eccentric segment 560 of the operating stem 56 to rotate relative to the quick release shaft 55.

[0027] The clipping block 54 is securely mounted around the mounting end of the quick release shaft 55, selectively abuts the corresponding free end of the rear fork 40 that mounted on the first engaging section 510 of the axle tube 51 and has a screw hole 540. The screw hole 540 is formed through the clipping block 54 and is screwed with the mounting end of the quick release shaft 55.

[0028] The slide block 53 is mounted around the quick release shaft 55 between the axle lid 52 and the operating stem 56 and has an outer side, a curved recess 530 and a through hole 531. The outer side of the slide block 53 faces the eccentric segment 560 of the operating stem 56. The curved recess 530 is formed in the outer side of the slide block 53 and abuts the eccentric segment 560 of the operating stem 56. The through hole 531 is formed through the slide block 53 and is mounted around the quick release shaft 55 between the axle lid 52 and the operating stem 56.

[0029] According to the above mentioned, the free ends of the rear fork 40 can be securely mounted between or separated from the engaging sections 510, 520 of the axle tube 51 and the axle lid 52 easily and conveniently by operating the stem segment 561 of the operating stem 56 to enable the clipping block 54 and the slide block 53 to clip or unloose the free ends of the rear fork 40.

[0030] The major belt pulley 21 is rotatably mounted around the axle section 511 of the axle tube 51 at the first sidewall of the supporting frame 11. The rotating axle 22 is rotatably mounted through the supporting frame 11 below the major belt pulley 21 and has a pulley end and a wheel end. The pulley end of the rotating axle 21 extends out of the first sidewall of the supporting frame 11. The wheel end of the rotating axle 22 extends out of the second sidewall of the supporting frame 11. The minor belt pulley 23 is mounted around the pulley end of the rotating axle 22.

[0031] The belt 24 is mounted around the belt pulleys 21, 23. The chain wheel group 25 is rotatably mounted around the axle section 511 of the axle tube 51 between the major belt pulley 21 and the axle lid 52, is securely connected to the major belt pulley 21 to enable the major belt pulley 21 to rotate with the chain wheel group 25 and has multiple wheel disks. The wheel disks have different diameters. The chain 41 of the bicycle 4 is mounted around one of the wheel disks of the chain wheel group 25. The idle wheel 26 is rotatably mounted on the supporting frame 11 between the belt pulleys 21, 23, abuts the belt 24 and has an idle wheel axle 28 mounted in the elongated hole 12 of the supporting frame 11. The adjusting screw 27 is mounted through the external surface of the supporting frame 11, extends into the elongated hole 12 and is screwed with the idle wheel axle 28 of the idle wheel 26. Then, the elasticity of the belt 24 between the belt pulleys 21, 23 can be adjusted by moving the idle wheel axle 28 relative to the elongated hole 12 of the supporting frame 11 to change the position of the idle wheel 26.
With reference to FIGS. 2, 8 and 9, the damping device 3 is mounted on the supporting frame 11 of the base 1, is mounted around the rotating axle 22 of the transmitting device 2 ad has a damping wheel 30, a magnetizer 31 and an adjusting assembly 32. The damping wheel 30 is made of magnetic metals, is securely mounted around the wheel end of the rotating axle 22 at the second sidewall of the supporting frame 11 opposite to the minor belt pulley 23. The magnetizer 31 is curved, is movably connected to the second sidewall of the supporting frame 11 around the damping wheel 30 to provide a resistance force to the damping wheel 30.

The adjusting assembly 32 is connected to the supporting frame 11 and the magnetizer 31 and has a fixing disk 33, an operating bar 34, a spring sheath 35, a spring 36, a ball 37, a linking arm 38 and a positioning bolt 39. The fixing disk 33 is securely mounted on the second sidewall of the supporting frame 11 adjacent to the rotating axle 22 and has multiple positioning holes 330 and a fixing hole 331. The positioning holes 330 are formed through the fixing disk 33 at intervals. The fixing hole 331 is elongated and is formed through the fixing disk 33 above the positioning holes 330.

The operating bar 34 is rotatably connected to the fixing disk 33 and has a lower end and an upper end. The lower end of the operating bar 34 is rotatably connected to the fixing disk 33. The upper end of the operating bar 34 upwardly extends out the fixing disk 33.

The spring sheath 35 is mounted securely on the operating bar 34 and faces the fixing disk 33. The spring 36 is mounted in the spring sheath 35. The ball 37 is movably mounted in the spring sheath 35, is pushed against the spring 36 and engages in one of the positioning holes 330 of the fixing disk 33. The linking arm 38 is connected to the operating bar 34 and the magnetizer 31. The positioning bolt 39 is mounted through the fixing hole 331 of the fixing disk 33 and the operating bar 34 and is securely connected to the linking arm 38 to limit the angle between the operating bar 34 and the linking arm 38.

With reference to FIG. 10, when the operating bar 34 is rotated relative to the fixing disk 33, the magnetizer 31 will move close to or far away the damping wheel 30 by the linking arm 38 connecting to the operating bar 34 and the magnetizer 31. Then, the resistance force between the magnetizer 31 and the damping wheel 30 can be adjusted by rotating the operating bar 34. In addition, the positioning bolt 39 needs to be loosen before rotating the operating bar 34 relative to the fixing disk 33, and needs to be fastened after the operating bar 34 moving to a desired position to fix the operating bar 34 and the linking arm 38 securely. Furthermore, when the operating bar 34 rotates relative to the fixing disk 33, the ball 37 is moved with the operating bar 34 and engages in one of the positioning holes 330 of the fixing disk 33 to provide a positioning effect to the operating bar 34.

In use, with reference to FIGS. 3 and 7, the rear wheel 42 of the bicycle 4 is separated from the rear fork 40, the holding grooves 43 of the rear fork 40 are respectively mounted around the engaging sections 510, 520 of the axle tube 51 and the axle lid 52, the chain 41 of the bicycle 4 is mounted around one of the wheel disks of the chain wheel group 25. Then, the rear fork 40 of the bicycle 4 can be held on the same height as the height of the rear wheel 42 mounted on the rear fork 40 and this can simulate the actual riding status to improve the training effect of the person. Especially, during the training period, the rear wheel 42 is separated from the rear fork and the training apparatus in accordance with the present invention and this can prevent the rear wheel 42 from wearing and tearing during the training period. In addition, the minor belt pulley 23 is rotated with the major belt pulley 21 via the belt 24 and the rotating inertia force of the major belt pulley 21 is fitted with the moving inertia force of the bicycle 4. Then, the training status of the training apparatus can be simulated to close the actual riding status and this can provide a preferred training effect to the person.

Furthermore, the chain 41 of the bicycle 4 is mounted around one of the wheel disks of the chain wheel group 25 and this can reduce the noise. Additionally, the training apparatus in accordance with the present invention is directly mounted on the rear fork 40 of the bicycle 4 and this can reduce the volume of the training apparatus and is convenient in transporting and carrying.

Even though numerous characteristics and advantages of the present invention have been set forth in the foregoing description, together with details of the structure and features of the invention, the disclosure is illustrative only. Changes may be made in the details, especially in matters of shape, size, and arrangement of parts within the principles of the invention to the full extent indicated by the broad general meaning of the terms in which the appended claims are expressed.

What is claimed is:

1. A training apparatus for a bicycle having a rear fork with two ends and two holding grooves, a chain and a rear wheel, and the training apparatus having a base; having a holding mount mounted on the ground and having a top surface; and a supporting frame mounted on the top surface of the holding mount and having a free end; a first sidewall; an external surface formed between the sidewalls of the supporting frame; and a second sidewall; a transmitting device rotatably mounted on the base and having an axle assembly mounted through the free end of the supporting frame, being adapted to hold the free ends of the rear fork of the bicycle; a major belt pulley rotatably mounted around the axle assembly at the first sidewall of the supporting frame; a rotating axle rotatably mounted through the supporting frame below the first sidewall of the supporting frame; and a wheel end extending out of the second sidewall of the supporting frame; a minor belt pulley mounted around the pulley end of the rotating axle; a belt mounted around the major belt pulley and the minor belt pulley; and a chain wheel group rotatably mounted around the axle assembly near the major belt pulley, securely connected to the major belt pulley to enable the major belt pulley to rotate with the chain wheel group and having multiple wheel disks with different diameters to enable the chain of the bicycle to mount around one of the wheel disks of the chain wheel group; and a damping device mounted on the supporting frame of the base, mounted around the rotating axle of the transmitting device ad having a damping wheel made of magnetic metals, securely mounted around the wheel end of the rotating axle at the second sidewall of the supporting frame opposite to the minor belt pulley; a magnetizer movably connected to the second sidewall of the supporting frame around the damping wheel to provide a resistance force to the damping wheel; and an adjusting assembly connected to the supporting frame and the magnetizer to enable the magnetizer to move close to or far away the damping wheel to adjust the resistance force between the magnetizer and the damping wheel.
2. The training apparatus for a bicycle as claimed in claim 1, wherein the axle assembly has a connecting sleeve securely mounted on the supporting frame near the free end of the supporting frame, extending out of the second sidewall of the supporting frame and having an inner end securely mounted in the supporting frame; and an outer end extending out of the second sidewall of the supporting frame; an axle tube securely mounted in the connecting sleeve, extending out of the ends of the connecting sleeve and having a first end extending out of the first sidewall of the supporting frame; a second end extending out of the second sidewall of the supporting frame; an external surface; a first engaging section formed in the external surface of the axle tube near the second end of the axle tube to engage one of the holding grooves of the rear fork of the bicycle; an axle section formed on the external surface of the axle tube near the first end of the axle tube and extending out of the first sidewall of the supporting frame; and an axle hole formed through the ends of the axle tube; an axle lid securely connected to the axle tube, mounted around the axle section of the axle tube and having an inner end connected to the first end of the axle tube; an outer end formed around the outer end of the axle lid to engage the other holding groove of the rear fork of the bicycle; a second engaging section; and a lid hole formed through the ends of the axle lid; a quick release shaft mounted through the lid hole of the axle lid and the axle hole of the axle tube and having a mounting end extending out of the second end of the axle tube; a connecting end extending out of the axle lid; and a pivot segment formed in the connecting end of the quick release shaft; an operating stem rotatably connected to connecting end of the quick release shaft and having an eccentric segment pivotally connected to the pivot segment of the quick release shaft; and a stem segment formed with the eccentric segment of the operating stem to enable the eccentric segment of the operating stem to rotate relative to the quick release shaft; a clipping block securely mounted around the mounting end of the quick release shaft, selectively abutting the corresponding free end of the rear fork that mounted on the first engaging section of the axle tube and having a screwed hole formed through the clipping block and screwed with the mounting end of the quick release shaft; and a slide block mounted around the quick release shaft between the axle lid and the operating stem and having an outer side facing the eccentric segment of the operating stem; a curved recess formed in the outer side of the slide block and abutting the eccentric segment of the operating stem; and a through hole formed through the slide block and mounted around the quick release shaft between the axle lid and the operating stem; the major belt pulley is rotatably mounted around the axle section of the axle tube at the first sidewall of the supporting frame; and the chain wheel group is rotatably mounted around the axle section of the axle tube between the major belt pulley and the axle lid.

3. The training apparatus for a bicycle as claimed in claim 2, wherein the connecting sleeve has an inner threaded hole formed through the ends of the connecting sleeve; and the axle tube has a threaded section formed around the external surface of the axle tube between the first engaging section and the axle section and screwed with the inner threaded hole of the connecting sleeve to connect the axle tube with the connecting sleeve.

4. The training apparatus for a bicycle as claimed in claim 3, wherein The adjusting assembly has a fixing disk securely mounted on the second sidewall of the supporting frame adjacent to the rotating axle and having multiple positioning holes formed through the fixing disk at intervals; and a fixing hole being elongated and formed through the fixing disk above the positioning holes; an operating bar rotatably connected to the fixing disk and having a lower end rotatably connected to the fixing disk; and an upper end extending out of the fixing disk; a spring sheath mounted securely on the operating bar and facing the fixing disk; a spring mounted in the spring sheath; a ball movably mounted in the spring sheath, pushed against the spring and engaging one of the positioning holes of the fixing disk; a linking arm connected to the operating bar and the magnetizer; and a positioning bolt mounted through the fixing hole of the fixing disk and the operating bar and securely connected to the linking arm to limit the angle between the operating bar and the linking arm.

5. The training apparatus for a bicycle as claimed in claim 4, wherein the supporting frame has an elongated hole formed through the sidewalls of the supporting frame between the free end of the supporting frame and the holding mount; the transmitting device has an idle wheel rotatably mounted on the supporting frame between the belt pulleys, abutting the belt and having an idle wheel axle mounted in the elongated hole of the supporting frame; and an adjusting screw mounted through the external surface of the supporting frame, extending into the elongated hole and screwed with the idle wheel axle of the idle wheel.

6. The training apparatus for a bicycle as claimed in claim 4, wherein the supporting frame is detachably mounted on the holding mount.